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Australian Personal Computer

VOL. 22 NO. 9 SEPTEMBER 2001

STORAGE SUPERGUIDE

ISSN - 0725-4415 Print Post Approved PP255003/00559

Dell™ office

OFFICE SYSTEMS TO TAKE ON ALL WORK CHALLENGES



All Dell Dimension™ 4100 desktops featured in this advertisement are shown with optional 17" Trinitron flat display monitors.

Hot Business Value Bundle

Dimension™ 4100 Desktop

- Intel® Pentium® III Processor 1GHz
- Intel® 815e Chipset
- 20GB[1] HDD
- 128MB 133MHz SDRAM ■ 3.5" FDD
- 16MB ATI RAGE 128Pro 4X AGP Graphics Card
- Creative Labs SoundBlaster 64Voice PCI Sound Card
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Power Business Bundle 8100

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- Intel® Pentium® 4 Processor 1.3GHz
- Intel® 850 Chipset ■ 3.5" FDD
- 128MB RDRAM ■ 20GB[1] HDD
- 48X Max CD-ROM
- 32MB nVidia GeForce2 MX AGP Graphics Card
- 15" Colour Monitor (13.8"v.i.s.)
- Sound Blaster Live! Value 576 Voice Sound Card
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Business Value Solution 4000

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- Mobile Intel® Pentium® III Processor 800MHz featuring Intel® Speedstep™ technology
- 128MB SDRAM
- 10GB[1] HDD ■ 3.5" FDD
- 8MB AGP 2X ATI RAGE MOBILITY 128™ 3D Video
- 3D Positional Sound with Wavetable
- 24X Max CD-ROM
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Lowest Price Server 300SC

POWEREDGE™ 300SC SERVER

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- 256KB Internal L2 Cache/100MHz
- 64MB 100MHz SDRAM With ECC
- 10GB[1] IDE Hard Drive
- 3.5" 1.44MB Diskette Drive
- Intel® Pro 100+ NIC
- Integrated IDE Controller
- 48X Max EIDE CD-ROM Drive

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Upgrade from 128MB to 256MB SDRAM (2x128) **$368*** Upgrade from 20GB[1] to 40GB[1] Hard Drive **$108***
Upgrade from CD-ROM to DVD-ROM **$119*** Upgrade from 15" to 17" Monitor (15" v.i.s) **$216***
Add 10/100 NIC **$141*** Add 56k Modem **$113***

Inspiron™ Upgrades (Valid on Inspiron™ 4000, 8000 or 2500)

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Upgrade from 24x Max CD-ROM to 8x DVD-ROM **$281*** Upgrade from 24x Max CD-ROM to CD-RW Drive (8x Write, 20x Read) **$509*** Add Second Battery **$216*** Add Advance Port Replicator **$563***

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Dell™ home entertainment

ENTERTAINMENT PACKAGES WITH POWER TO BURN



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Ultimate Gaming Solution

Dimension™ Desktop 8100

- Intel® Pentium® 4 Processor 1.5GHz ■ 3.5" FDD
- Intel® 850 Chipset ■ 20GB[1] HDD ■ PC Stereo Speakers
- 128MB RDRAM ■ 16X Max DVD-ROM
- 32MB DDR nVidia GeForce2 GTS AGP Graphics Card
- SoundBlaster Live! Value 576Voice Sound Card
- 17" Colour Monitor (15.9"v.i.s.)
- Norton Anti-Virus 2001 - OEM
- 56K Modem ■ Enthusiast Game Pack

▸PLUS Your Choice of 1 Dimension™ FREE Bonus[4]

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Value Gaming Package 4100

DIMENSION™ 4100 DESKTOP

- Intel® Pentium® III Processor 1GHz
- 20GB[1] HDD ■ Intel® 815e Chipset ■ 3.5" FDD
- 128MB 133MHz SDRAM
- Harmon Kardan® Stereo Speakers
- 32MB nVidia GeForce2 MX AGP Graphics Card
- Creative Labs SoundBlaster 64Voice PCI Sound Card
- 48X Max CD-ROM ■ PowerGame Pack II
- 15" Colour Monitor (13.8"v.i.s.)
- Norton Anti-Virus 2001 - OEM

▸PLUS Your Choice of 1 Dimension™ FREE Bonus[4]

$1,999* VALID TILL 7/9/01 PRICE INCLUDES GST. DELIVERY ADDITIONAL

$14.55 PER WEEK** Consumer loan. Conditions apply.

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All You Need Bundle 8100

INSPIRON™ 8100 G866VT NOTEBOOK

- Mobile Intel® Pentium® III Processor 866MHz-M featuring Intel® Speedstep™ technology
- On-die 512K L2 Cache ■ 128MB PC133 SDRAM
- 20GB[1] HDD ■ 3.5" FDD
- 32MB DDR 4X AGP NVIDIA® GeForce2 Go™ 3D Video ■ 24X Max CD-ROM ■ Carry Case
- 3D Positional Sound with Wavetable
- Harman/Kardon® Odyssey® 2 Speakers (Internal)
- 15" Super XGA+ TFT Display (1400x1050 res)
- Internal Mini-PCI 56K Capable Fax Modem

▸PLUS Your Choice of 1 Inspiron™ FREE Bonus[4]

$3,699* VALID TILL 7/9/01 PRICE INCLUDES GST. DELIVERY ADDITIONAL

$26.90 PER WEEK** Consumer loan. Conditions apply.

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Ultimate Power Package 8100

INSPIRON™ 8100 G1130VT NOTEBOOK

- Mobile Intel® Pentium® III Processor 1.13GHz-M featuring Intel® Speedstep™ technology
- On-die 512K L2 Cache ■ 256MB PC133 SDRAM
- 20GB[1] HDD ■ 24X Max CD-ROM
- 32MB DDR 4X AGP NVIDIA® GeForce2 Go™ 3D Video ■ 3D Positional Sound with Wavetable
- Harman/Kardon® Odyssey® 2 Speakers (Internal)
- 15" Super XGA+ TFT Display (1400x1050 res)
- Internal Mini-PCI 56K Capable Fax Modem
- Carry Case

▸PLUS Your Choice of 1 Inspiron™ FREE Bonus[4]

$4,699* VALID TILL 7/9/01 PRICE INCLUDES GST. DELIVERY ADDITIONAL

$34.20 PER WEEK** Consumer loan. Conditions apply.

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Dimension™ FREE Bonuses[4]

At Dell™, you get to choose how your system is put together. For any Dimension™ system featured in home entertainment or home work you also get to choose a free bonus[4] peripheral pictured here. But please note, these offers do not apply to systems on the Dell™ office page.

ADDITIONAL 64MB SDRAM
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8100 only



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Dell™ Computer is the world's #1 computer systems vendor, primarily selling to large business, government and education. According to research firm IDC, Dell™ is the number 1 supplier of personal computers in the USA, UK, Ireland and Canada.

Award-winning service and reliability

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90 DAY PAYMENT FREE LOAN PLAN AVAILABLE**

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You can purchase Dell™ desktops, notebooks and servers by phoning 1300 303 107 Mon-Fri 8am to 8pm (EST) or online 24 hours a day at www.dell.com. You can choose from our flexible payment options of commercial rental, BPAY, direct deposit, cheque, Visa, Mastercard, Bankcard or take advantage of our 90 day payment-free leasing (business) or payment plan (consumer).

DELL™ PRICE $50 CHALLENGE^

Desktops and notebooks: If you can find a lower advertised price for an IBM, COMPAQ, HP, TOSHIBA or GATEWAY desktop or notebook of the same specification and configuration as a Dimension™ or Inspiron™ currently available and quoted by Dell™ we will better that price by $50^.



Dell™ Dimension™ Desktop 8100

with Intel® Pentium® 4 Processor 1.3GHz shown with optional 19" Trinitron flat display monitor



Dell™ Inspiron™ 4000 G850X Notebook

with Mobile Intel® Pentium® III Processor 850MHz featuring Intel® Speedstep™ technology

3D TOUR VISIT:
www.dell.com/inspiron4000tour

^DELL™ PRICE CHALLENGE TERMS AND CONDITIONS (1) Program valid until 7th September 2001. All orders of Inspiron notebooks and Dimension desktops to be confirmed by 7th September 2001. Subject to product availability, each customer is limited to 10 units of the Inspiron notebook or Dimension desktop. (2) Proof of competitor's offer must be in the form of web page or print advertisement or such other form as deemed acceptable by Dell, and to be provided prior to the placement of any orders. (3) Competitor's offer must be the advertised price available to the general public within validity period of the programme, and Dell reserves the right to decline a price comparison if the competitor's offer is not bona fide. (4) Competitor's offer must be in relation to a new notebook, desktop of the same configuration and specification as the Inspiron notebook or Dimension desktop, including the same Intel processor, RAM, hard disk; video subsystem, screen; and notebook peripherals but excluding external peripherals (Inspiron only). (5) Price comparison is on the basis of the price of the notebook, desktop or server system inclusive of freight/handling charges and taxes. (6) Program available for Dell Home and Small Business customers only. Resellers excluded. Cannot be combined with any other Dell discount or promotion other than as advertised in this advertisement.

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Dell™ homework

HOME SYSTEMS TO HANDLE ANY PRICE CHALLENGES



Dell Inspiron™ 4000 shown with optional colour kit.

Notebook Value Solution

Inspiron™ 4000 G800X Notebook

- Mobile Intel® Pentium® III Processor 800MHz featuring Intel® Speedstep™ technology
- 128MB SDRAM ■ 10GB[1] HDD
- 8MB AGP 2X ATI RAGE MOBILITY 128™ 3D Video
- 24X Max CD-ROM
- Carry Case ■ 3.5" FDD
- 3D Positional Sound with Wavetable
- 14.1" Super XGA+ Display (1400x1050 res)
- Internal Mini-PCI 56K Capable Fax Modem

›PLUS Your Choice of 1 Inspiron™ FREE Bonus[4]

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Value Multimedia Solution 4100



DIMENSION™ 4100 DESKTOP

- Intel® Pentium® III Processor 933MHz
- 20GB[1] HDD ■ Intel® 815e Chipset ■ 3.5" FDD
- 128MB 133MHz SDRAM
- Harmon Kardon® Stereo Speakers
- 16MB ATI RAGE 128 Pro 4X AGP Graphics Card
- SoundBlaster Live! Value 576Voice Sound Card
- 48X Max CD-ROM ■ 56K Modem
- 15" Colour Monitor (13.8"v.i.s.)
- Norton Anti-Virus 2001 - OEM

›PLUS Your Choice of 1 Dimension™ FREE Bonus[4]

$1,899* VALID TILL 7/9/01 PRICE INCLUDES GST. DELIVERY ADDITIONAL

$13.80 PER WEEK** Consumer loan. Conditions apply.

Please Quote when ordering
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My First Notebook Package 2500



INSPIRON™ 2500 C800ST NOTEBOOK

- Mobile Intel® Celeron™ Processor 800MHz
- 10GB[1] HDD ■ 128MB SDRAM ■ 3.5" FDD
- 24X Max CD-ROM ■ Carry Case
- Intel® Integrated 3D AGP graphics with up to 8.0MB shared system memory
- Sound Blaster compatible Audio
- 12.1" SVGA TFT Display (800x600 res)
- Internal Mini-PCI 56K Capable Fax Modem

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Surf the Web Bundle 2100



Pictured with optional 19" Trinitron Flat Display Monitor.

DIMENSION™ 2100

- Intel® Celeron™ Processor 800MHz
- 128MB PC100 Shared SDRAM ■ 3.5" FDD
- 20GB[1] HDD ■ PC Stereo Speakers
- Intel® 3D Direct AGP Graphics
- Creative Labs SoundBlaster 64Voice PCI Sound Card
- 48X Max CD-ROM ■ 56K Modem
- 15" Colour Monitor (13.8"v.i.s.)
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›PLUS Your Choice of 1 Dimension™ FREE Bonus[4]

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TSH14001-3L

Some light reading.

OBSERVATION: There is no such thing as a 'typical' mobile computer user.

CHALLENGE: Make it easy for everyone planning to move on from their desktop or upgrade their existing machine to find a suitable notebook.

SOLUTION: Offer the widest range of any manufacturer. Divide the range into four model lines. Develop a clear design focus for each.

RESULT:



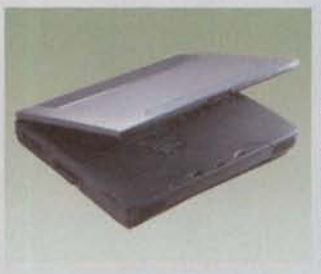
TECRA: for large corporate users looking for state-of-the-art performance, an advanced feature-set, expandability and the lowest total cost of ownership. Ten models to choose from.

Tecra 8200 shown: Intel® Pentium® III processor featuring Intel® Speedstep™ technology/1GHz/ultra high resolution 14.1" SXGA+ TFT screen/DVD/CD-Read & Write/fast and secure wireless network access with built-in wireless LAN card and aerial/Optional modular SelectBay and port replicator.



PORTÉGÉ: for highly mobile individuals looking for full functionality and exceptional reliability in the lightest and thinnest possible package. Four models to choose from.

Portégé 3490 shown: Intel® Pentium® III processor featuring Intel® SpeedStep™ technology/700 MHz/high resolution 11.3" display/20mm thin/ultra-portable B5 format/1.5kg/elegant and robust magnesium alloy case and chassis/up to 9 hours battery life for all day independence.



SATELLITE PRO: a general business powerhouse for operators looking for top of the line performance, a full feature-set and expandability at a value price. Ten models to choose from.

Satellite Pro 4600 shown: Intel® Pentium® III processor featuring Intel® SpeedStep™ technology/900 MHz/huge 30Gb HD/DVD/Brilliant 15" TFT screen/advanced graphics card and sound system/fast and secure wireless network access with built-in wireless LAN card and aerial/optional port replicator.



SATELLITE: for smaller businesses and home users looking for a full feature-set, solid performance and reliability at a value price. Seven models to choose from.

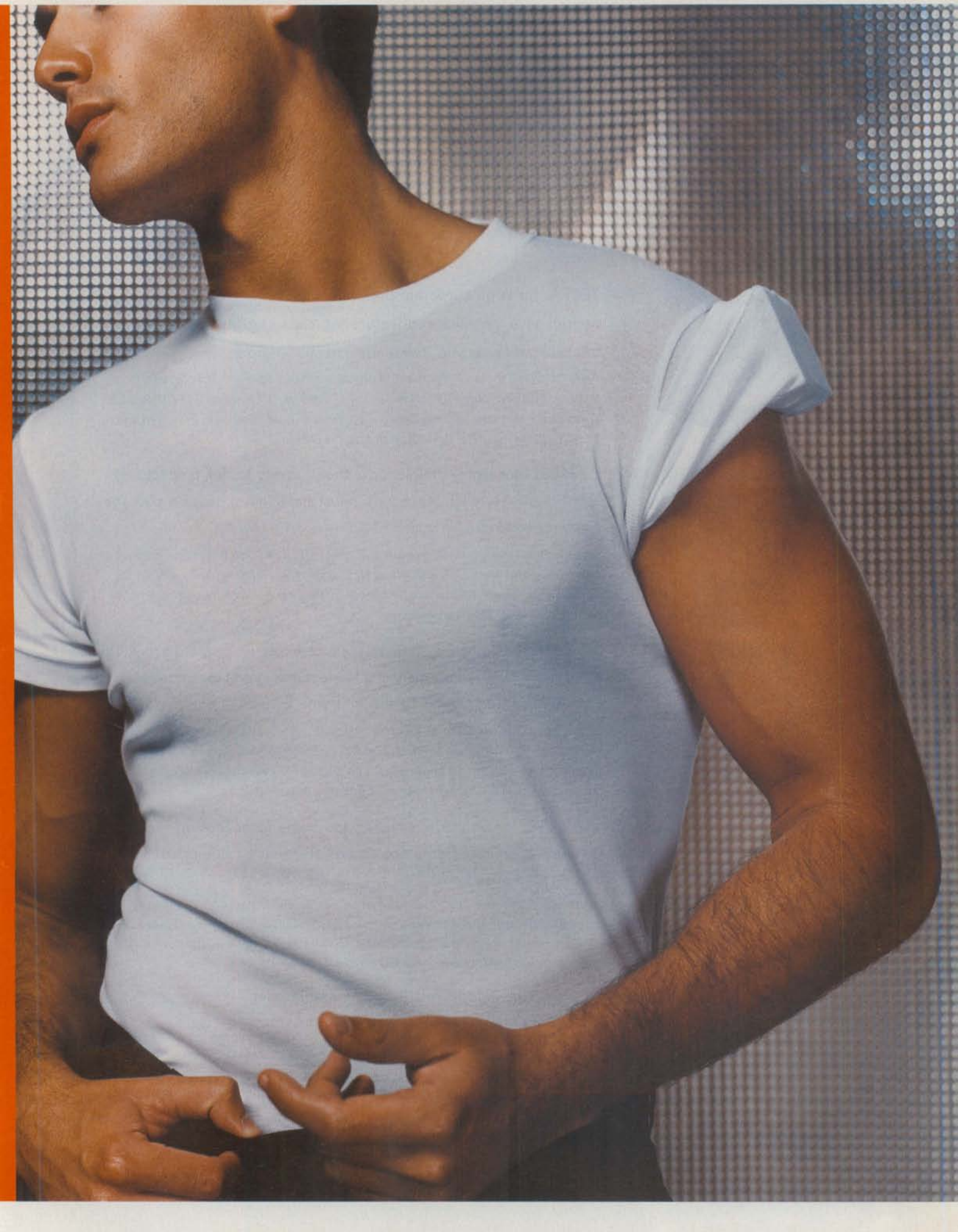
Satellite 3000 shown: Intel® Pentium® III processor/850 MHz/14.1" TFT display/ modular DVD/best-of-class nVidea GeForce 2 Go graphics/Crystal sound processor/ iLink for digital video download/SmartMedia slot for digital camera download/ modular SelectBay for swappable CD-RW/HDD/battery.

CONTACT: To weigh up the options, visit your nearest Toshiba 5-Star reseller (call 1800 021 100 for locations). For more product information visit www.isd.toshiba.com.au

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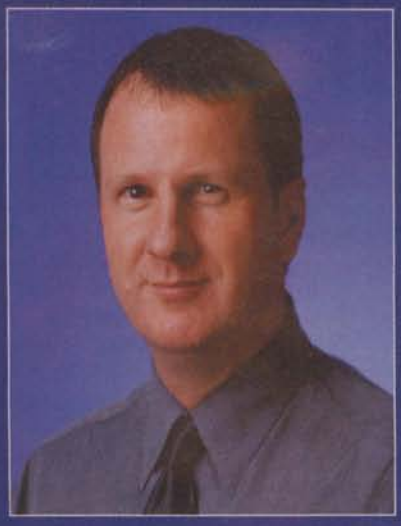


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2828XER/APC/04 2001



David Flynn

David Flynn can be contacted at apc@acptech.net.

Australia's best computer and technology magazine is about to get even better!

Time to upgrade

It's not often that an editorial exhorts you to head straight for the very last page. Traditionally, that's where the fun stuff goes. The fluff. The most significant parts of the magazine sit proudly at the front, or occupy vast expanses in the middle. But for this month only, we've put something incredibly significant right down the end, on humble little page 192.

That's because page 192 is where you'll get a sneak peek at the new *Australian Personal Computer* magazine. Go on, flick the pages and have a look. Indulge me like the proud parent I am.

Next month, we unveil the most radical upgrade to *APC* since it first appeared in May 1980. And my choice of the word "upgrade" is deliberate.

We're all used to upgrading our hardware and software. Sure, sometimes it's more of a bother than a blessing, but upgrading is what keeps us ahead of the curve. It's what lets us do the coolest stuff and enjoy everything the personal computer has to offer, and then some. So it's time that *APC* did likewise — time for us to take Australia's leading computer and technology magazine and make it even better.

Next month, we unveil the most radical upgrade to *APC* since it first appeared in May 1980.

To use a software analogy, *APC* will gain a new interface — one that takes everything we have and makes it more accessible, more enjoyable. Think of it as *APC XP* (or *APC X*, if you're a Mac fan). It's all about making *APC* look as good as the gear we write about.

At the same time, this involves more than just putting lipstick on the chicken. We're adding new features to the established formula; like a good OS, we're reflecting the needs of the day as well as laying the path for going forward. Beneath that "interfacelift", however, you'll see the same solid foundations that have kept us in the number one spot for 21 extraordinary years.

APC has always brought you the best and most independent reviews of the very latest hardware and software, carried out in the *APC* Labs testing facility.

This month is no exception, with Alex Kidman tackling Australia's first review of the Pentium III Mobile processor, parked inside IBM's sleek new ThinkPad T23 (see page 25). As of October, you'll see even more reviews in *APC* every month.

We'll also continue our exhaustive product features, like this month's storage superguide, which starts on page 68. Where else would you find a roundup of storage that covers everything from pocket-sized USB flash memory sticks to small business solutions which pack so much space that they deserve their own postcode? Even a download king like reviewer Darren Ellis couldn't fill these drives to anywhere near their limits.

APC also goes the extra mile to help you make use of the technology. On page 102, Daniel Gardiner rounds up the best FTP clients so you can go into a file-fetching feeding frenzy. Then he goes a step further and shows you how to set up your own PC as an FTP server, which makes it a cinch to grab files from your home PC while you're at work (or vice versa), and also lets you share files with your friends.

The new *APC* won't lose any of these attributes. It'll just get way better, as will our Web site at www.apcmag.com. It's already Australia's most popular technology hub, but that's not good enough. We're working on making it slicker, faster and easier to navigate.

In fact, I don't expect the changes ever to stop, because that's not the way this industry works. In both print and pixel, *APC* will continue to move forwards — sometimes in small steps, sometimes in one vast leap. And, as always, we're thrilled to have you with us on our journey!

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It could be time to consider acquiring some property.

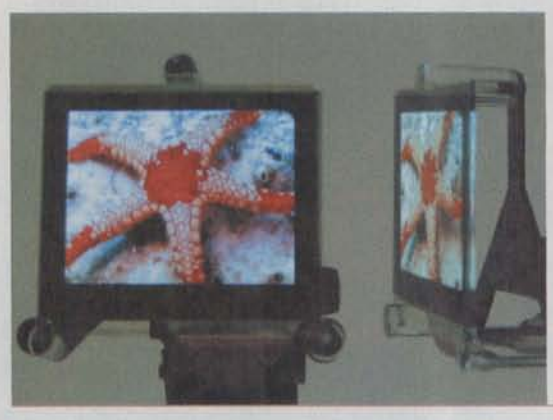
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A sneak preview of the new-look *APC*

Storage superguide

The Internet age has seen storage needs explode. Computer games, digital video and music are stretching our resources to the limit, and there's no doubt that storage space is one thing you can always use more of. *APC* evaluates devices for file sharing, general storage and expanding your current storage base.



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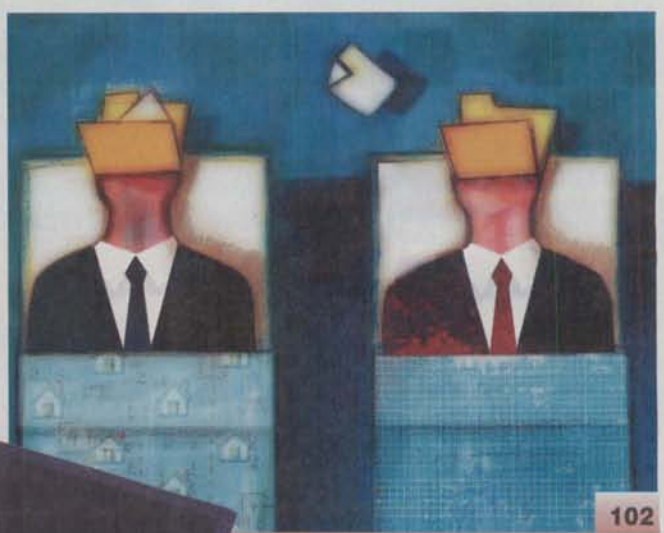
A healthy glow

Notebook screens look set to become much more affordable. Harnessed properly, organic electroluminescent displays are everything that LCD technology isn't — light, bright and easy to manufacture.

In Forum 66

FTP face-off

The secret to using FTP effectively has always been choosing the right client for your requirements. To help you make a good decision, *APC* has reviewed the latest generation of FTP clients.



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Dial M for mobile

Intel's latest chip technology, the Pentium III-M processor, has bypassed the desktop and gone straight into portable PCs. *APC* dives under the hood of the first Pentium III-M notebook.

In First Take 24

Duelling databases

The Web has prompted a resurgence of interest in databases. They're the backbone of most major commercial Web sites, and they're also likely to become necessary to anyone who uses a PC frequently. Which database package is the best? *APC* challenged the reigning champions, Access and FileMaker, to a duel.



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Multi-Format Memory Card Reader

In a perfect world, all the gadgets linked up to your PC could use the same sort of solid-state memory. The Multi-Format Memory Card Reader allows your Windows PC or Mac to read the four most common card formats.

In First Take 38

Recordable DVD divide

At the moment, DVD fans can choose between three different recordable DVD formats. DVD-RAM, DVD-RW and DVD+RW are all being adopted, but are they compatible? *APC* gives them a once-over.



In News 18



Imation SuperDisk 240M

The 240M SuperDisk is Imation's second attempt at deposing the Iomega Zip as the de facto removable storage standard. *APC* takes you through the pros and cons of this new product.

Also in First Take: reviews of two Toshiba Satellite notebooks, two IBM ThinkPads and Macromedia ColdFusion Server 5.

In First Take 36

Building the agile ebusiness



Ebusiness is a little out of favour at the moment, but this doesn't mean companies have stopped looking for effective electronic business infrastructures. *APC* discovers which elements are needed to create great systems.

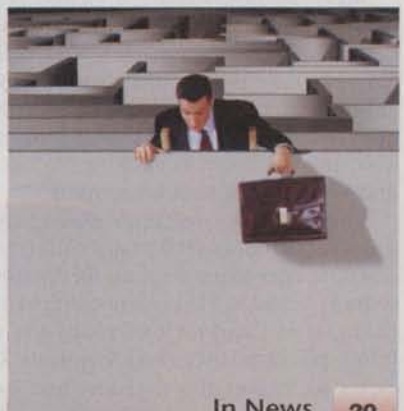
Also in Corporate IT: discover why Australian companies have been so slow to pick up contract management, and why insurance companies are beginning to see Windows NT as a liability.

In Corporate IT 112

Gas guzzlers on the info superhighway

The digital age is making ever greater demands on Australia's energy supplies. Is the digital lifestyle really as green as it seems?

Also in News: Microsoft isn't out of hot water yet, the iMac hits a mid-life crisis and renegade domain name dealers try to undermine the Internet.



In News 20

Software giant Microsoft is under closer antitrust scrutiny than ever before.

Microsoft battles not over

Microsoft chief technology officer and founder Bill Gates was in a buoyant mood on June 28. "I'm incredibly optimistic about the future," the world's richest man told a news conference, following the announcement that the Court of Appeals had sent the long-running antitrust case against the company by the US Department of Justice (DOJ) back to the district court for review. Gates acknowledged that the case had been "challenging" and was still far from finished, but he reaffirmed his belief that the company had been given a clear message that its addition of extra features to operating systems was not illegal.

But was the decision really such a victory for Microsoft? Opinion is still divided on the ultimate impact of the appeals court ruling, and Microsoft's own reactions have been far from consistent.

The software giant can draw comfort from the fact that the harsh break-up plan proposed by Judge Thomas Jackson last year has been killed off. However, the new judgement stopped well short of dismissing Jackson's original finding that the company had broken antitrust laws by attempting to stifle competitors. As such, it may have a major impact on Microsoft's future software plans, and especially on its operating systems.

The decision did reject some specific allegations of illegal tying practices, but it upheld the original finding that Microsoft had abused its monopoly of power in the operating systems market. In effect, the court still thinks Microsoft is guilty of antitrust offences; it just wants to find a more appropriate punishment.

Break-up plans seem to be out of the picture for now. Instead, many observers believe that the District Court might place further restrictions on Microsoft's ability to tie its various products together, particularly the Windows OS varieties and Internet services such as Hailstorm and Windows Instant Messaging.

The company initially downplayed suggestions that court findings could make any difference to future plans for operating systems products. "There is nothing in [the] ruling that changes our plans for our future products, including Windows XP," Gates said after the decision had been announced.

However, just a fortnight after that statement, the changes to Windows XP began. Microsoft announced that, as a result of the ruling, it would make it possible to remove Internet Explorer from the operating system and would no longer enforce a "clean" desktop for Windows XP, meaning that PC manufacturers will now be able to add icons for services and software of their choice. During the original trial, Microsoft had maintained that it was technically impossible for Internet Explorer to be removed from Windows, leading some commentators to suggest that new legal action might result.

Bad relations

In the earlier stages of the court action, it had been suggested that any remedies that were proposed would not affect future plans, since the original court case only centred on Windows 95 and its successors, rather than on Windows NT or other product lines. However, remedy rulings in antitrust cases are also expected to deal with possible future actions by the offender. If the court follows that principle, it means that Windows XP and 2000, and other technologies such as Hailstorm, will also be placed clearly on the table.

New evidence of the company's sometimes troubled relationship with other developers who want to work with those products continues to emerge. Kodak has complained that Windows XP makes it virtually impossible to ensure that users of its digital cameras can automatically access Kodak's own software (rather than Microsoft's) when a camera is plugged into their PC, and have called in lawyers to investigate possible action. In addition, Microsoft is planning to charge digital image printing services for inclusion within the OS, just as it currently charges ISPs for preferential inclusion.

Microsoft has also engaged in a public battle with US access giant AOL — now the owner of Netscape and widely perceived as Microsoft's strongest rival in the Internet space — over the incorporation of AOL's updated 7.0 client into Windows XP. (Those talks fell apart without a deal being struck, and AOL could now deal with PC manufacturers to have its software included.)

As the release date of Windows XP draws closer, critics allege that Microsoft



Illustration by Warren Taylor

is edging out competitors in everything from digital music to instant messaging. Microsoft is also copping flak over its plan for selling business services over the Web, which requires Windows users to submit personal details to the Microsoft-owned Passport database.

Such examples make it harder for Microsoft to maintain its position that in recent years it has, in Gates' words, "done even more to partner and communicate with companies throughout the industry". Convincing the court of that proposition will be critical to its long-term health, especially if the DOJ decides to follow up the recent allegations with fresh investigations.

In the short term, Microsoft has gained one major advantage. While the District Court mulls over possible future remedies (no firm date for a decision had been reached at press time), there are no current restrictions on the software giant's actions. Observers worry that by the time the court makes a decision, the market will once again have moved on and opportunities for new competitors will be lost. As open source advocate Andrew Leonard noted in a recent commentary: "Microsoft can continue doing as it pleases, unhampered by any current legal restrictions or punishment for past behaviour."

Angus Kidman

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Can the wild child of the PC industry make it through middle age?

iMac hits midlife crisis

When Steve Jobs showed off the latest iMacs at MacWorld in July, the audience was stunned by the new machines: they looked . . . just like the old ones.

It was the first iMac series *not* to have a new look. Many Mac fans were expecting to see the iMac redesigned in keeping with the new iBook, or an iMac with an LCD screen. Instead, Apple announced more powerful iMacs in rehashed and sombre colours, along with faster versions of the G4 machine. There was no show-stopper.

Suddenly, the PC maker with the reputation for style looked very staid. Three weeks before, Apple revealed it had suspended production of the Cube — the radical desktop that made a huge splash last year.

The iMac is starting to lose its power to turn heads. In the cosmetics section of Sydney's largest Grace Bros, Lancome has one of the original candy-coloured iMacs on its counter. The saleswoman said they'd bought the machine a couple of years ago to display Lancome's product range. Now the once-trendy computer looks scratched and dated — and it wasn't working on the day we visited.

New iMac colours have been an annual event since the iMac was first announced in 1998. iMac sales now make up more than one-third of all Macs sold, and style has always been the essence of its popularity. However, over the last year, sales of the iMac have declined dramatically. In the three months to June 30, Apple sold 306,000 iMacs — 141,000 fewer than in the same period last year.



▲ Steve Jobs addressing the MacWorld conference.



▲ The new iMacs: more of the same.

IDC Australia senior analyst Logan Ringland said that many Mac fans are demanding too much, too quickly. "This was the first time in years there has been no significant announcement at MacWorld," he said. He suggested that Apple may be trying to consolidate in the tough economic climate, and might announce new hardware when sales start to pick up.

However, a long stretch without innovation could hurt the company. "In order to keep its head above the others, Apple has to be different. I was hoping they would come out with something that would capture the market," he said. Despite tough times, iMac sales were still slightly higher than they were in the first three months of this year.

Ringland argued that the "style" factor is an important feature of the Mac. "It keeps Apple in the top of people's minds. When they think of cool design, they think Apple."

Right now, Apple is putting power and substance before style. While iMac owners have never boasted about power, new models now have the power and space to rival a G4. The new high-end iMac has a 700MHz G3 processor with 256M and a 60G hard drive, and like the 600 and 500MHz models, comes with CD-RW. Video editing is a whole lot easier.

However, all this extra power comes at a price. The 700MHz model costs $3,395, compared to $3,195 for the top 600MHz, 128M, 40M model in the old series. The $1,895 entry-level 500MHz model in the new series only has 64M (not enough to run OS X) and 20G, but costs $100 more than the bottom 400MHz, 64M, 10G model in the old series. Apple Australia corporate affairs manager Myrna Van Pelt said the price hike was needed "to compensate for the exchange rate". She added that Australian iMac sales had remained strong and steady, despite the "tough" market.

What about colours? iMac owners can now choose between "Snow"-coloured machines, "Indigo", or "Graphite". "At the end of the day, a customer will make a purchasing decision based on what the computer will deliver for them," Van Pelt said.

Retailers still believe colour is a major selling point for the iMac, although they agree that flashy designs are not the most popular. "People tend to like the conservative colours," said Renai Lawrence, director of Apple reseller Computers Now. "They like Graphite because it matches home entertainment systems and is more neutral. It looks more like the G4 and the PowerBook."

By far the best selling iMac has been the Indigo-coloured model. The floral and spotted designs were a "little bit too radical" for customers, Lawrence said. The Snow colour was also not a great seller. "It looks fabulous and gets a great response on our demo floor, but not in sales."

At My Mac Australia, sales manager David Jolley said the flamboyant iMacs might be great as "talking points" in showroom situations, but customers tend to prefer low-key colours. "It's been such a great seller that I don't expect it to change much," Jolley said.

At Lancome's cosmetics counter, the hot pink iMac still attracts attention. "The men and children love to play around on it while they wait," the salesperson said. Would she want a hot pink iMac in her own home? "As long as it works, I don't really mind."

Fiona Angus

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"Alternative" domains are creating chaos for the Internet's naming system.

Anarchy on the Internet

The first new top-level domain names to be seen on the Internet in 15 years will go live in September and October. In an attempt to exploit the hype surrounding the debut of .info and .biz, a band of renegade domain dealers are selling "alternative" domains.

Some of the names have mysterious double meanings, while others don't even work. Victorian Internet service provider The Tenex ISP Group has devised .au.bz, the so-called "Australian Business Domain". On its Web site, Tenex does not mention that .bz is also the country code of Belize, a tiny South American republic between Guatemala and Mexico. Apart from domain names, Belize's major exports are sugar and bananas.

However, the Melbourne company which has invested millions in the *real* .biz is not impressed. Melbourne IT is concerned that people who have bought an "Australian Business Domain" don't realise it also stands for "banana republic".

"Consumers need to be educated so they know this is a country code and it comes under the whim of Belize," said Melbourne IT technical project manager David Taylor. Belize is one of a group of countries, including Columbia (.co), Tuvalu (.tv) and the Coco Islands (.cc), which have sold their catchy country codes to private companies. Taylor is concerned that if the Belizean Government chooses to reclaim its rightful domain, Web sites with .au.bz could suddenly be left nameless. "I am disappointed that a lot of country codes have been used in this way. They do have a right to do this, but it is not good when it is not made clear to consumers."

Tenex general manager Mark Wiemels does not think the domain is misleading. He acknowledges that it is possible for the Belizean Government to reclaim .bz, but argues that the same rules apply to any approved domain. He said .au.bz is not meant to be a competitor of .biz, but an alternative to .com.au. "The .biz domain is suited to global companies; this is more for local business." Melbourne IT also controls the .com.au space.

Wiemels decided to start selling .au.bz because a growing number of his customers had problems registering .com.au names, due to ongoing technical breakdowns, administrative delays and policy restrictions in the space. For example, one of his customers had their application for www.bucket.com.au rejected. He assumed it was because "bucket" was a banned generic name, but later discovered it clashed with the name of a small town. "It's crazy," he said. Now he is planning an advertising campaign to try and make .au.bz *the* name of choice for Australian business. He has also registered .nz.bz, .uk.bz and .za.bz.



Illustration by Chris Bray-Cotton

Country codes may not have been intended to be used like this, but they are still legitimate domains. Other domain dealers are exploiting the demand for domains by selling unsanctioned names — domains that are not approved by the Internet's governing body (ICANN), and do not automatically work on the Internet.

Taylor said some people may not be able to distinguish between an approved top-level domain like .biz, a misused country code like .au.bz and an unsanctioned name. It is easy to set up a personal domain space and there are countless "private" domains used by corporate and community intranets. "The important point is that they only work for a small number of people."

The problems start when domain dealers sell these names. To access an unsanctioned domain, users have to download special software or access the Internet via an ISP which has reconfigured its servers to support the names. US domain seller New.net, which lost its bid to have .web introduced as an official domain, now offers a huge list of renegade names (including .xxx, .shop and .love) to anyone willing to download a special plug-in. New.net claims over 50 million people can view its breakaway domains.

However, major Australian ISPs are not likely to support any splinter domain movement. An OzEmail spokesperson stated: "We helped to pioneer the standards that are the basis for the Internet industry in Australia. Playing rogue only undermines these standards." Taylor doesn't believe these names pose a threat to top-level domains like .com, .net or .biz. "But it could cause fragmentation if 10% of users access an [unsanctioned] name." He also points out that unofficial names are not bound by the same rules as official domains and that if New.net were to collapse, so would its domains. "These are private companies that are not accountable to the public. There is no consumer protection."

The real fight will begin if an unofficial name is ever made official. "There is not so much of a problem now, but in two or three years, there might be some consumers who are burned." The AtlanticRoot Network now claims it owns the "authentic" .biz (as well as .god and .sex), yet without the blessing of ICANN, its domain is meaningless.

"These companies are claiming to have a product that they don't really have," Taylor said. "For the Internet to work, you need a policy framework. I'm disappointed that they have jumped the gun."

Fiona Angus

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PC manufacturers are betting on three recordable DVD formats, but are they compatible?

Recordable DVD divide

In case you haven't noticed, the "next big thing" in the home PC world has reached Australia: recordable DVD. Offering at least 4.7G of storage space per disc, DVD could one day be the new disc of choice for recording data and video. The only problem is deciding which format to use.

Budding movie directors currently have three choices: DVD-RAM, DVD-RW and DVD+RW (see table below). DVD-RAM has been available for some time, but it doesn't work in most read-only DVD drives because it requires a disc caddy.

PC vendors now appear to be heading towards the other two disc formats, which don't have this problem. It should be possible to sit at a PC, record movies to these discs, and then play them in a home theatre equipped for DVD.

Early reports paint the situation as an all-out format war. Pioneer is on one side with its dual DVD-R (write once) and DVD-RW (rewritable) drive, which can now be found in the top-of-the-line Apple G4 and Compaq Presario PCs. The drive can also record to CD. This technology is still expensive. At the time of writing, Pioneer's drive (DVR-A03) cost more than $2,000, a single DVD-R cost $26 and DVD-RW discs cost $59.

In the other camp is Hewlett-Packard, which promises to add DVD+RW to its Pavilion home PC before the end of the calendar year. Dell also looks like offering DVD+RW, although no specific details were available at the time of writing. Sony has a foot in each camp.

The biggest question for home PC owners is whether the two formats are compatible. This is not easy to answer at this stage. We spoke to drive manufactures and PC vendors and came away scratching our heads.

Hewlett-Packard claimed its drive will read (but not record) the competing DVD-RW format. When we asked whether DVD+RW would work in Pioneer's DVD-RW drive, it was explained that the discs are supposed to work in drives that can play ordinary DVD-ROM discs, and therefore "should" work in Pioneer's drive.



Then we called Pioneer spokesperson Graham Ham, who said no, the new DVD writer does not accept DVD+RW discs. The main problem seems to be that since DVD+RW products aren't being sold yet, Pioneer can't test the format.

Confused? In the long run, there may not be a problem. Ham said that when DVD+RW products eventually materialise, other vendors are likely to add compatibility to their products. "It's probably just a firmware upgrade," he explained.

This could be crucial. DVD is being tipped to replace everything from CDs to videotape in cameras and VCRs. If and when recordable DVD becomes popular, it could be *the* standard for storing data, home movies and even television shows.

Some vendors, such as Philips, want DVD to replace the VCR eventually. Pioneer has VCR-style DVD recorders planned for early next year, and the DVD+RW camp has also demonstrated prototypes. And not only standalone DVD players will be capable of recording television. In the US, Sony has unveiled a new version of its Vaio PC that can record directly from television to DVD.

The long-term implications of manufacturers being split between two types of recordable DVD are evident. "We are going to end up to some extent in a Beta/VHS situation," said Ham, adding that this isn't likely to occur for three or four years.

Hewlett-Packard's spokesperson agreed. "Yes, there is a bit of a format war over the best rewritable DVD technology." They argue that the winner will be the format that works best with ordinary DVD-ROM drives and home entertainment players.

Yet even this isn't without problems. Neither camp claims their discs will work in every single DVD-ROM drive or DVD player. Apple, for instance, has set up a Web page so that customers can find out which DVD players will play DVD-R (www.apple.com/dvd/compatibility).

Dell has perhaps made the wisest decision of all, choosing not to take part in discussions about compatibility issues until a clear winner emerges.

Director of Corporate Communications Rob Small explains: "I've had feedback from our product experts in this area and they are in agreement that there is confusion about which format will emerge as the industry 'standard'. We are leaning toward DVD+RW but haven't made an absolute commitment to the technology yet."

In the long run, all this may not really matter. DVD movies do seem to be rapidly gaining popularity, but it will be a very long time before we are using the discs to record our favourite Simpsons episodes. By that time, confusion about recording formats should be history.

William Maher

Rewritable DVD*

DVD-RAM: 4.7G per side. Data stored in similar fashion to hard drive. Requires disc caddy. Not backwards compatible with most DVD-ROM drives and DVD players.

DVD-RW: 4.7G per disc. Backwards compatible.

DVD+RW: 4.7G per disc. Backwards compatible. Read/write system different to DVD-RW.

***Note: R means write once (as in DVD-R or DVD+R). RW means rewritable (as in DVD-RW or DVD+RW).**

LCD screen prices are falling fast. Will LCD replace the ubiquitous CRT monitor?

Tech fashion: flat screens are in

Flat panel screens are gaining popularity due to new LCD technology and falling prices. Old-style cathode ray tube (CRT) monitors won't disappear just yet, but companies such as Apple and IBM are leading the charge to make LCD the standard with many new PCs.

Apple is the most aggressive; it has already begun phasing out CRTs and shifting to digital LCD screens, except for the all-in-one iMac. At the time of writing, there were even rumours that Apple plans to introduce a flat-screen iMac, although LCD prices would still make this an expensive option.

Hitachi will stop making CRTs by the end of the year, arguing that "there are no prospects for growth of the monitor CRT market". The company will now focus on flat panel screens and is reviewing options for selling its CRT business.

IBM has also been touting the benefits of flat panels. For the first time, a 15in LCD is being offered as a standard option with new IBM computers. The company sells flat panels up to 21in.

"Our commercial [LCD] sales have pretty much doubled, and we expect that by Christmas, sales will be almost four times that figure," senior product manager for IBM Australia Kevin Yap said. The reason is mostly price. IBM's 15in flat screen cost $2,000 late last year, and now screens the same size can be found for less than $1,000.



▲ The 17in Apple Studio Display

That's certainly much cheaper, but is it cheap enough? $1,000 might seem a bargain for a 15in LCD, but it's extraordinarily expensive compared with $349 for a CRT screen of the same size.

Bigger LCDs cost a lot more. At the time of writing, Apple's prices were $1,399 for a 15in screen, $2,299 for 17in and $5,599 for a 22in "Cinema" display.

Dell's corporate spokesperson Rob Small explained that LCDs are still out of reach for most home PC buyers, although "we are selling an increasing number of flat panel displays. As the price comes down, the adoption rate grows. A large number of our corporate clients are now using flat panels, particularly for showcase areas like reception and training rooms for clients," he said.

The quality of LCD technology is also improving. IBM is working on super-high LCD resolutions, including a prototype with 200 pixels per inch (ppi), rather than the 80 to 100ppi offered by many CRT monitors. IBM also claims that LCDs can be manufactured far more cheaply now, and the screens have fewer flaws.

However, for now, retailers are focusing on the immediate benefits of flat screens. In the US, Apple uses the low power consumption of flat screens as a selling point for people concerned about power shortages. The screens also generate less heat, which Apple argues can save on airconditioning bills.



▲ Samsung 560V: the 15in LCD is under $1,000.

How long will it be before LCDs become standard with all desktop PCs? Kevin Yap argues that it won't happen in the next two years because LCDs will still be too expensive. He expects flat screens to account for 10% of IBM's screen sales by the end of this year. "If it gets up to 20% of the visual display market we would be very happy."

William Maher

PRODUCT SAFETY RECALL
Macintosh PowerBook 45W AC Adapters Model Number: M4402

Apple Computer Australia Pty Limited is conducting a voluntary recall to replace the AC adapters supplied with PowerBook G3 notebook computers. These AC adapters were supplied in the period May 1998 to March 2000.

The voluntary recall to replace the AC adapters is being carried out because the AC adapters may overheat, posing a fire hazard.

The AC adapter is enclosed in a small rectangular black plastic box. On one end of the box there is a permanently attached lead that connects to the computer, and on the other end there is a two prong detachable power cord that plugs into a power point. The AC adapter is approximately 125mm long by 50mm wide by 20mm high. A label located along the side of the adapter reads in part "Macintosh PowerBook 45W AC Adapter," "Model Number: M4402".

Customers with an AC adapter of the above model should call Apple Australia on 1800 001 912 , between 8am to 6pm Monday to Friday to arrange the shipment of a free replacement AC adapter.

Customers should have their AC adapter and PowerBook G3 serial number available when calling the above number.

This voluntary recall to replace the AC adapters is being conducted at the expense of Apple Computer Australia Pty Limited and not the customer.

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KAPL5534

Is the digital lifestyle really as green as it seems?

Gas guzzlers on the info superhighway

From PCs to handhelds and high-speed Net access, the digital age is making ever greater demands on Australia's energy supplies. Computers are becoming more energy-efficient, but techno-addicts who crave information technology "on demand" are becoming the new enemy of greenies everywhere.

Australia uses more energy per person than almost every other developed nation, according to the Australian Bureau of Statistics. A lot of this is wasted power. A recent study by the National Appliance and Equipment Energy Efficiency Committee found the average Australian household uses 760kWh of power each year just by leaving appliances on "standby" mode. This "phantom" power consumption makes up 11.6% of residential electricity use, and is increasing by 8% per year.

Energy Star, a government program designed to promote energy-efficient electrical equipment, is asking PC users to rethink their "always-on" attitude and power down at the end of each day. "Any standby load, whether it is from a home PC or a washing machine, is power wasted," Energy Star program manager Allison Purnell said.

Yet many people are so wired into the digital lifestyle, they find it hard to switch off, even when no-one's home. "We find that by and large, people are keen to do something environmentally positive when they know how, especially when it has a minimal effect on their lifestyle," she said.

In 1999, an Energy Star survey showed only half of all IT staff made sure their PCs complied with Energy Star's standards, which can reduce the power a PC consumes by up to 75%. If all the PCs in Australia used the power-saving methods, carbon dioxide emissions would drop by 2.3 million tonnes, and energy costs would plunge by $228 million each year. That's like removing half a million cars from the road.

Most of Australia's power comes from coal-fired power stations, so every PC contributes to the greenhouse effect. Computer systems are becoming more energy-efficient, but Purnell points out that office equipment accounts for about 20% of the electricity consumed in the commercial sector, and this is growing. "As the number of PCs grows, the load grows," she said. The program is working on energy-saving standards for new devices such as DVD players.



▲ Alleyways of the information superhighway: inside Pihana's Sydney data centre

According to the managing director of the Electricity Supply Association of Australia, Keith Orchison, household computers form a tiny proportion of overall energy consumption. He points out that almost three-quarters of Australia's energy use comes from business, and most of that is used by industry. Households only use about 20%.

If all the PCs in Australia used the Energy Star power-saving methods, carbon dioxide emissions would drop by 2.3 million tonnes per year.

Typical home PC users may not guzzle much power, but the infrastructure that supports one of the most favoured resources of home users, the Internet, is another matter. As the Web grows, all the data that speeds along it has to park somewhere. More of this precious data is finding its way into huge Internet data centres, which have sprung up like multistorey car parks.

The race to set up these centres is placing significant demands on Australia's power supplies. One centre can consume up to 40MW of electricity; that's enough power to supply four city blocks. Electricity suppliers are under pressure to cope with the power demands of these Internet parking stations.

EnergyAustralia spokesperson Peter Leates described the power demands of large data centres as being "fairly mind-boggling". He said EnergyAustralia is building a new substation in Macquarie Park in north Sydney, an area which is emerging as the geographical heart of Australia's Internet industry. The multimillion-dollar substation was fast-tracked after the area experienced a sudden 40% increase in electricity consumption last year.

There are up to 15 data centres vying to set up in the Macquarie Park area, all eager for a spot near technology giants such as Microsoft, Compaq, Phillips and Nortel. Across Sydney Harbour, the NSW government wants to build a huge technology hub near Sydney airport. Pihana has already built a massive Internet data centre nearby, contributing to the recent growth in power consumption in the area. Managing director Doug Oates said they selected the site because it is 400 metres away from the Southern Cross Cable (the fibre-optic link between Australia and the world).

Oates promises at least 99.999% "always-on" reliability (or one hour of downtime every decade) for all data housed in its 3,000m² facility. "The centre is designed to host crucial Web sites that cannot afford to go down if there is a power outage or the airconditioning breaks down," he said. Pihana made special arrangements with EnergyAustralia to set up reliable dual diverse feeds and an uninterrupted power supply. If the entire grid suddenly fails, Pihana's bank of generators will immediately power up.

Access to a reliable (and cheap) power supply is a major deciding factor in where these centres are built. Victoria and South Australia are in the midst of a power squeeze. A combination of privatisation and greater use of airconditioners has left the southern states facing significant price rises. In contrast, households in NSW will be able to choose their electricity supplier from January, which could lead to greater competition and possible price reductions.

Either way, many households will be examining their power bills this summer. Those living the "digital lifestyle" may find themselves unexpectedly counting the cost.

Fiona Angus



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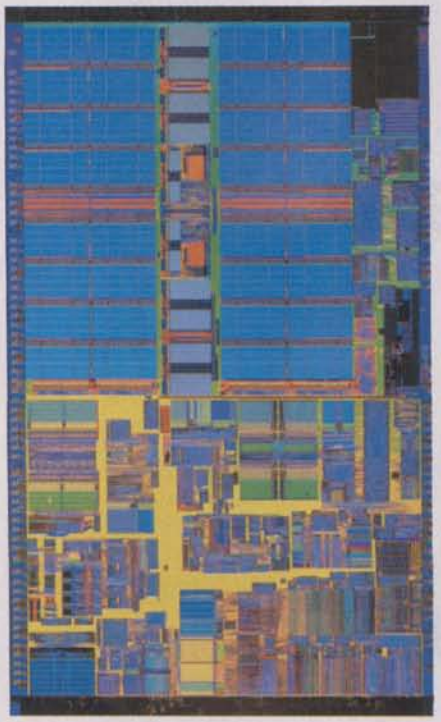
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Dial M for mobile

It's not often that notebook users can be said to be truly ahead of the technology curve. Although the notebook market remains vibrant, its technology has tended to be something of a hand-me-down after all the innovations have been made in desktops. The release of the 1.13GHz Pentium III-M changes the stakes for mobile and desktop users alike.

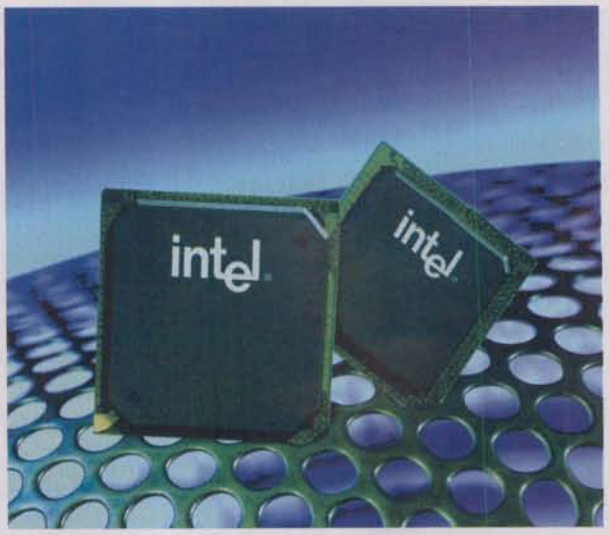
A new processor

Made-for-mobile processors have substantially different technical specifications and capabilities to their desktop counterparts. It's possible to build a notebook around a desktop processor, but that's not necessarily the best idea, because it compromises features such as longer battery life, which is crucial for mobile users.



▲ Inside the Pentium III-M

The Pentium III-M takes the difference between a mobile and a desktop processor a step further by being Intel's first chip to utilise a 0.13 micron process. This allows for lower power usage at similar clock frequencies: compare the 1.4V it uses at full speed with the 1.7V drain of a 1GHz mobile Pentium III. Processors only consume a small proportion of power overall, but any saving is still a good one.



▲ Intel's 830 chipset

It's when the frequencies are increased that the advantages of lower power usage really become clear. While previous mobile processors have used 1.7V to run at 1GHz, the same power drain can set the Pentium III-M processor galloping along at a much higher speed. On a similar note, as Intel undertakes the transition of all of its mobile Pentium III chips to Pentium III-M manufacturing, the power usage for lower speed processors also dips. All of this leads to longer battery life and, ultimately, extended processor life.

A new chipset

A new chipset design for notebook manufacturers is also in the works. The 830 chipset improves upon some existing Intel-specific technologies while raising the bar for anyone who wants to support other processors. The 830 chipset supports up to 1G of memory with a 133MHz frontside bus — so not only can you cram more memory into these little beauties, they'll also run faster.

Intel's Speedstep technology has an automatic setting which slides the power scales according to processor usage, and it introduces a Deeper Sleep suspend mode which, Intel claims, increases battery life by up to 60%.

The 830 also has features that will be more relevant to system integrators than users, although as they will affect the price, it's important to mention them. The 830 chipset supports up to six USB ports and the integration of LAN controllers on to the main chip, which should lower overall construction costs and save a reasonable amount of internal space, meaning that ultra-portable notebooks will be able to have more features. Intel will be offering the chipset in three varieties: with or without integrated graphics, and a budget platform with a lower graphics specification.

Intel Pentium 4 1.8GHz

Intel has had a hard time promoting the Pentium 4, because performance tests have shown that AMD's Athlon processors can achieve better results than similarly rated Intel chips. Intel's position on this has been that Pentium 4 machines are yet to encounter software that really tests their capabilities, and that investing in a Pentium 4 is insurance for the future. Still, Intel has to sell processors that perform well now, and its main marketing strategy has been to increase the speed of Pentium 4 systems.

Intel's latest incremental improvement is the 1.8GHz Pentium 4. The company supplied *APC* with a test system so that we could benchmark the processor, along with a 1.7GHz Pentium 4 CPU for comparative purposes. Both processors are fast and powerful beasts, but is the jump from 1.7 to 1.8GHz really worth the cost?

The test system Intel supplied isn't available to the general public, but it wouldn't be impossible to build. It comprises an Intel D850GB motherboard, 256M of RDRAM, a 30G IBM drive and a 64M GeForce 2 Ultra graphics card, as well as the Pentium 4 processors.

We ran our usual suite of benchmarks across the system, using both the 1.7 and 1.8GHz processors. There's about a 6% difference in megahertz between the two processors, but in our testing, this difference was actually anywhere between 1% and 10%. On the positive side, the 1.8GHz system performed better than expected in the Graphics WinMark tests, but worse in video and games benchmarks. This suggests that the extra speed boost helps benchmarks, but isn't

Intel's latest chip technology bypasses the desktop and goes straight into portable PCs. ***Alex Kidman*** *explores the Pentium III-M processor and dives under the hood of the first PIII-M notebook.*

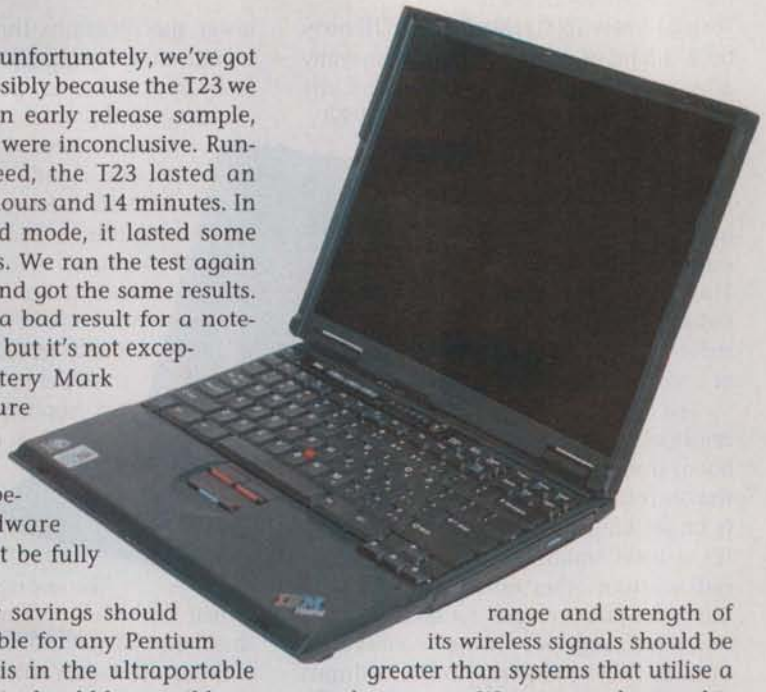
A new notebook

The first notebook incorporating all the new technologies to drop into our laps was the IBM T23 ThinkPad. The T23 has just about everything mentioned here: a 1.13GHz processor, the 830 chipset and 128M of 133MHz SDRAM. That's quite a potent combination, and we were keen to see how how it measured up when it came to what *really* counts — performance. It didn't disappoint. In the Ziff-Davis Disk WinMark tests, the T23 was well ahead of any system we've seen, buoyed by the combination of the funky processor, the 133MHz memory and the general quality of IBM hard drives, which many other notebook vendors favour for their machines. The scores even beat 1GHz machines with twice the system memory — a very impressive result.

Similarly, in the SYSmark test it smoked every other notebook tested this month, meaning that this is a great system for business applications.

Its graphics performance was something of a mixed bag, however. With only 16M of graphics memory on board, we weren't expecting miracles, and we didn't get them. The Business and High-End Graphics WinMark scores of 872 and 352 were about what you'd expect for 2D graphics tests, and likewise, the Quake III frame rates we got were decent but not spectacular. The extra memory bandwidth and processor grunt certainly help here; we suspect we'll have to wait for a Pentium III-M notebook with a 32M GeForce2GO (or similar) to see some really impressive figures.

Intel has decided to concentrate its 0.13 micron process on mobile processors to maximise the efficiency of the power usage, and here, unfortunately, we've got less to report. Possibly because the T23 we looked at was an early release sample, our battery tests were inconclusive. Running at full speed, the T23 lasted an acceptable two hours and 14 minutes. In battery-optimised mode, it lasted some four minutes less. We ran the test again in both modes and got the same results. Two hours isn't a bad result for a notebook of this size, but it's not exceptional. The Battery Mark test is by nature synthetic, and therefore capable of errors, especially on hardware that may not yet be fully optimised.



Where power savings should be more noticeable for any Pentium III-M processor is in the ultraportable category, where it should be possible to put smaller and lighter batteries into notebooks while retaining battery life. The result is a lighter notebook that should run with less heat — another important notebook consideration. On the subject of heat, the T23 has one of the better heat dissipation arrangements we've seen in a high-speed notebook. Most of the base stays acceptably cool, and only a couple of small areas generate any appreciable heat.

A new processor and chipset isn't the only factor that should be considered when purchasing a notebook, and the T23 has other features likely to endear it to customers, especially business purchasers. The T23 includes not one but two built-in 802.11b antennas. This doesn't mean that it works with two networks independently, just that the theoretical range and strength of its wireless signals should be greater than systems that utilise a single antenna. We attempted to test this using the same methodology as our last round of wireless testing (see *APC* August, page 114), only to find that the "poor" position in our office was no longer poor at wireless reception. Still, even a quick look at transmission figures showed that the dual antenna setup did increase outgoing signal strength to other antennas and via access points. Incoming signals were about the same strength, however. Security — often compromised in notebooks — also gets more than lip service in the T23, with hardware-level system security for encrypting passwords and securing data.

The T23 is just the first of many 1.13GHz Pentium III-M notebooks we expect to be passing through the doors at *APC*, and we highly recommend it for business buyers.

nearly as noticeable in real applications. The full benchmark results and specifications can be found on this month's cover CDs.

Intel hasn't yet released local pricing details for the 1.8GHz processor. The US OEM price is $562 for 1,000 unit quantities, and the 1.7GHz remains at $352. These prices will be significantly higher in Australia for conversion and tax reasons. At the time of writing, a 1.7GHz processor costs between $900 and $1,000, depending on the supplier. Taking into account tax and low exchange rates for the Australian dollar, the 1.8GHz processor will probably cost at least 75% more. In other words, you'd almost be able to get two 1.7GHz processors for the price of one 1.8GHz processor. If you went the AMD route, you'd enjoy similar if not better performance for several hundred dollars less.

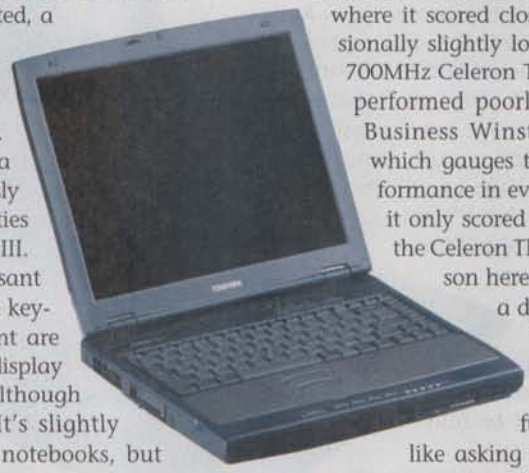
It's only a matter of time before OEMs start selling full 1.8GHz systems, and when that happens, it'll be interesting to see how they stack up against other full systems. At present, if you are considering upgrading just one component, the performance gains are far outweighed by the high price of the new processor. It is only recommended if bragging about speed is very, very important to you.

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Toshiba Satellite 1800

Toshiba's new 1800 series Pentium III notebook is a bit of a puzzle. Toshiba currently offers two default configurations for the 1800 series: a Celeron 800MHz (the 9S9) and the one *APC* tested, a Pentium III 850MHz (the WFX). Both notebooks come with only 64M of RAM. This is acceptable for a Celeron, but it seriously reduces the capabilities of a regular Pentium III.



The WFX is a pleasant notebook to use. The keyboard and TrackPoint are responsive, and the display is bright enough, although it's a little small. It's slightly bulkier than other notebooks, but this is the price you pay for DVD, floppy and a full range of ports and connectivity options. When playing DVDs, it drains slightly less battery power than the Satellite 2800/15 — on average, it used about 10% for 10 minutes of playback.

The WFX's benchmark scores are rather disappointing, because the machines with lower specifications that we tested this month often outclassed it. This was especially apparent in Ziff-Davis' Business and High-End Graphics WinMark 99 tests, where it scored close to (and occasionally slightly lower than) IBM's 700MHz Celeron Thinkpad. It also performed poorly in Ziff-Davis' Business Winstone 2001 test, which gauges the system's performance in everyday use. Here it only scored 2% higher than the Celeron Thinkpad. The lesson here is clear: without a decent amount of RAM, high-end processors cannot realise their full potential. It's like asking a riot cop to do their job without pants. Sure, the baton, shield and helmet are all menacing — but without the basics, their effectiveness is seriously hindered.

The WFX's default configuration situates it uncomfortably between budget and mid-range notebooks. It has some of the features of a high-end system, such as DVD, onboard infra-red, and just about every input and output port you could need. Toshiba seems to be trying to get the best of both worlds, mixing components from different price ranges to create a competitively priced portable that packs a punch. Unfortunately, the WFX's overall system performance is let down by the fact that its processor needs at least 128M of RAM to do its job. Full test results can be found on this month's cover CDs.

If you're after a decent mid-range notebook, the WFX is a reasonable choice — but do yourself a favour and fork out the extra $80 for a memory upgrade.

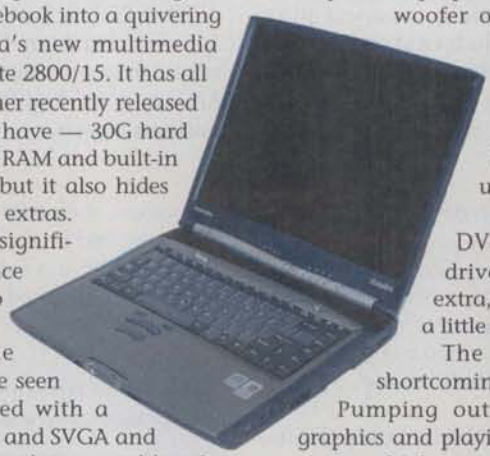
Daniel Gardiner

Pros Pleasant interface and bright screen
Full port replication and peripherals
Cons Insufficient RAM

Contact Toshiba
Phone 1800 021 100
Online www.isd.toshiba.com.au
Price $3,740

Toshiba Satellite 2800/15

It's always been something of a geek's dream to play Quake 3 Arena pumped up to a high resolution on the train trip home. Alas, when turned up to 1,024 by 768 resolution, Quake 3 is capable of turning an otherwise sound notebook into a quivering mess. Enter Toshiba's new multimedia notebook, the Satellite 2800/15. It has all the features most other recently released high-end notebooks have — 30G hard drive, DVD, 128M of RAM and built-in network support — but it also hides some rather enticing extras.



The notebook's significant 3D performance is mainly due to nVidia's GeForce-2GO chipset — the first of its kind we've seen in action. Combined with a sizeable 15in screen, and SVGA and video-out, it's more than capable of pumping out classy presentations. DVD playback is also impressive, but flickering is occasionally apparent in scenes with a lot of light. When plugged into a stereo TV, DVD sound quality is also exceptional.

The system has a built-in subwoofer, the first we've encountered in a notebook. As with most notebooks, the regular audio is tinny and sounds like what you get from cheap desktop speakers. With the subwoofer on, it's more like a medium-sized radio, although listening to anything at high volume becomes decidedly uncomfortable.

The 6x/4x/24x DVD/CD-RW combo drive is another useful extra, but its CD burning is a little slow.

The 2800/15's biggest shortcoming is its battery life. Pumping out great-looking 3D graphics and playing music and DVDs comes at a high cost — one that standard battery tests don't reveal. Battery Mark credits the notebook with one hour and 57 minutes in maximum performance mode, but listening to 15 minutes of MP3 music in this mode drains about 7–8% of the battery. Trying to perform multimedia tasks using battery-optimised mode is also painful. DVD playback is especially taxing — it must be run in maximum performance mode to maintain a consistent frame rate. The result is an 18% battery drain for 15 minutes of play, so don't expect more than about 70 minutes of power. Full test results can be found on this month's cover CDs.

Despite its minor flaws, the 2800/15 successfully combines all the best elements of a robust desktop PC for the road. It has considerable muscle for raw processing as well as graphics and multimedia. If you need a portable with high-end capabilites, you can't go past this notebook.

Daniel Gardiner

Pros Powerful and full-featured
Cons Multimedia tasks drain battery rapidly

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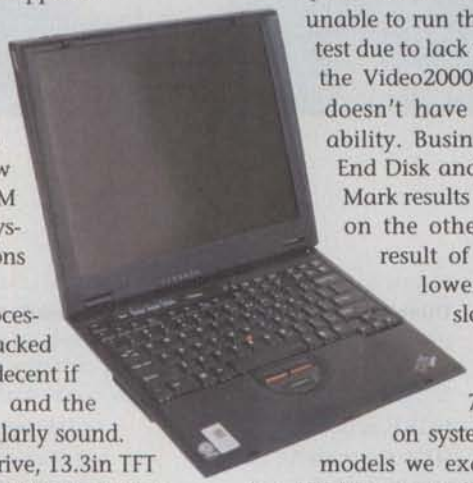
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IBM ThinkPad 11715XM

IBM notebooks have always been good performers, but you could never accuse them of being cheap. In part, you pay for the performance, but to a large extent it's been the brand name that has added to the price.

This was an acceptable approach when notebooks were very exclusive and very expensive a few years ago. However, other companies have since adapted to lower prices, and IBM is now doing so as well. The IBM ThinkPad 11715XM is a system with decent specifications at a budget price.



A Celeron 700MHz processor provides the grunt, backed by 64M of RAM. That's a decent if unexciting combination, and the rest of the package is similarly sound. There's a 10G IBM hard drive, 13.3in TFT screen, and the standard IBM TrackPoint controller nestled just below the G and H keys. Full specifications and test results can be found on this month's cover CDs.

As can be expected from a system with lower specifications than its immediate competitors, the 11715XM's benchmark scores didn't knock our socks off, but we were pleasantly surprised in some areas. The Trident Cyberblade graphics chip performed well at higher resolutions in our Quake tests. However, it was unable to run the SYSmark2000 test due to lack of memory, and the Video2000 test because it doesn't have DVD decoding ability. Business Disk, High-End Disk and Graphics WinMark results were lower than on the other notebooks, a result of the 11715XM's lower memory and slower processor.

Compared with other 700MHz Celeron systems, such as the models we examined in May (see *APC* May, page 68), the 11715XM produced middle of the range results. However, its battery life is definitely impressive. In battery-optimised mode, the 11715XM lasted three hours and 28 minutes — longer than all of its competitors. Combined with its relatively low weight (2.52kg) this makes the system good for travelling, especially as it has enough power for most business applications and presentations.

Its other interesting inclusion is the 802.11b antenna for wireless networking. The 11715XM isn't alone in offering this — *APC*'s August wireless roundup included a few notebooks with built-in wireless technology (*APC* August, page 112) — but it's great to see that this technology has started to appear in budget lines.

The 11715XM is a good corporate notebook. It's not the most powerful machine available at this price, but it does what it does well.

Alex Kidman

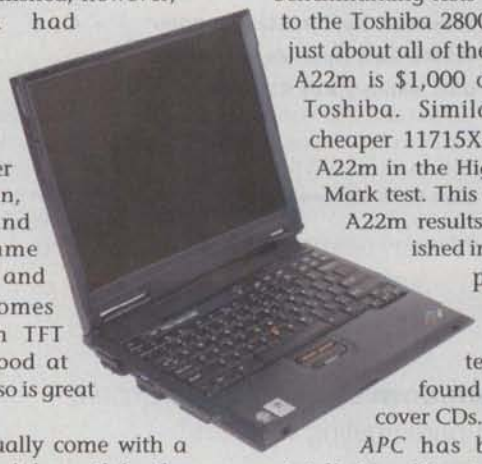
Pros Good battery life

Cons Could be underpowered for graphics-heavy applications

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Price $2,999

IBM ThinkPad A22m

The ThinkPad A22m was sitting pretty at the top of IBM's notebook heap when *APC* began testing it. It was the fastest of the lot. By the time we'd finished, however, the T23 notebook had appeared with a 1.13GHz processor (see page 25). Is the A22m still worth buying?



IBM notebooks never change their basic design, because it's a solid and well-proven one. Same TrackPoint, keyboard and chassis. The A22m comes with a bright 14.1in TFT screen, which looks good at quite acute angles, and so is great for presentations.

1GHz notebooks usually come with a heap of extras. This can't be said for the ThinkPad A22m. Unlike the NEC Versa RXi and the Gateway Solo 9500XL (see *APC* May, page 30), it has foregone the extras and relies instead on its specifications to sell at much the same price as its more heavily equipped competitors.

Apart from the T23, the A22m was the only 1GHz system *APC* looked at this month. Surprisingly, it didn't top our benchmarking tests — it came second to the Toshiba 2800 (see page 26) in just about all of them. Of course, the A22m is $1,000 cheaper than the Toshiba. Similarly, the much cheaper 11715XM outclassed the A22m in the High-End Disk WinMark test. This doesn't mean the A22m results were bad; it finished in the middle of the pack in this month's round-up of notebooks. Full test results can be found on this month's cover CDs.

APC has been critical of Intel's SpeedStep technology in the past for having little effect on overall battery life. However, IBM must have been tweaking the settings — or perhaps implementing other behind-the-scenes battery saving measures — as the A22m managed an extra 37 minutes of battery life in performance-optimised mode. At just over two and a half hours, it lasted only a few minutes less than its cheaper 11715XM stablemate. The A22m's DVD drive does a good job of DVD playback on the 14.1in TFT screen, but images were a little dark and grainy in places. Like the 11715XM, the A22m comes with a built-in 802.11b antenna.

Compared to other notebooks with 1GHz processors, the A22m's performance is only average. None of its scores are truly poor, but because it has fewer features than rival products, it isn't a compelling purchase.

Alex Kidman

Pros Good battery life

Cons Better 1GHz machines are available for the same price

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Compaq Evo N400c



Sony has virtually defined the market for slimline notebooks with its Vaio range — its continually expanding brand covers almost every possible portable configuration. Compaq's Evo N400c is similar in many ways to its Vaio counterparts: it's small, light, thin, capable and a bit expensive. But is it any better?

Like most slim portables, the N400c is a bare-bones system when it comes to peripherals. CD-ROM and floppy drives have been sacrificed for portability. It's still packed with all the usual connection options: network and modem ports; USB, parallel and serial ports; and VGA and RCA-video out for presentations.

The system is lightweight and looks great. The keyboard and Point Stick device are responsive and pleasant to use. Its only real fault is that the keys on the top row are exceptionally small.

Cashing in on the current trend towards wireless, the N400c comes wireless-ready. The MultiPort (a shielded slot inside the notebook's lid) will allow users to upgrade to wireless simply by slotting in either a BlueTooth or an 802.11 module. Unfortunately, neither was available locally at the time of writing, although they had been released in the US.

A minor bonus is that the Evo supports Windows' ability to estimate the remaining battery life in hours and minutes with a measure of accuracy. This is an incredibly useful feature, and one lacked by almost all the notebooks we looked at.

It's impossible to do a direct performance comparison between the Vaio and the Evo, due to the fact that most Vaios refuse to run the standard benchmarks. Based on overall cost and system specs, a Vaio costs slightly less than an Evo with a similar configuration. Previously, we looked at the Vaio PCG-R505CT (*APC* August, page 26). It has comparable specs to the Evo, but features an 850MHz Pentium III processor, and comes with a DVD and CD-RW-equipped docking bay. The R505 costs around $800 more than the N400c at $5,899. However, with the addition of a CD-RW-enabled docking bay (without DVD capabilities), the Compaq comes in at over $6,300. A DVD drive will set you back a further $500 or so.

As a no-frills system, the N400c operates quite well and had very reasonable benchmarks, given its system specs. Full test results can be found on this month's cover CDs. Most users with access to a networked environment could do without the floppy drive or CD-ROM. It's still a little overpriced, though, especially considering the other options available at present.

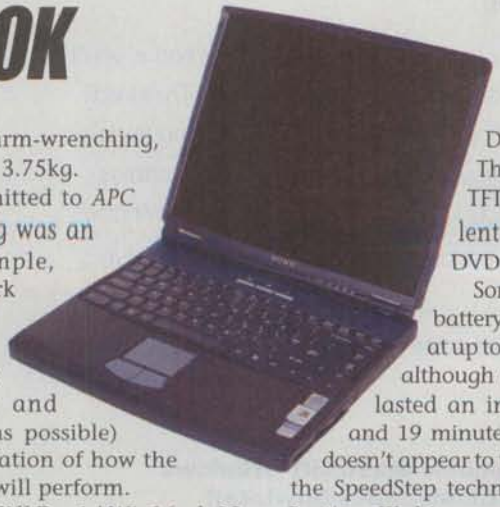
Daniel Gardiner

Pros Pleasant interface and layout

Cons No CD or floppy drives
Only supports Type II PC Cards

Contact Compaq
Phone 13 23 93
Online www.compaq.com.au
Price $5,095

Sony Vaio PCG-FX880K



It's a mystery that Sony can craft some of the most stylish notebooks to be seen among the café set, yet it insists on lumbering them with monikers like PCG-FX880K. Despite the name, this rose still smells sweet.

Packing more of a wallop than any of the Vaio series, Sony has fitted the FX880K with an 850MHz Intel Mobile Pentium III processor (instead of the Transmeta Crusoe processor used in the more lightweight Vaio portables) and 128M of SDRAM.

The chunky design is a marked departure from Sony's more familiar streamlined shapes, but it is form based on function — as an all-in-one notebook, the FX880K cuts no corners. Intended for the all-round mobile user market, the PCG-FX880K is part multimedia beast, part gaming machine, part entertainment system and part business workhorse. Just don't expect to get a high degree of portability as well.

The dimensions and weight mean that this notebook almost qualifies as a desktop replacement — it has everything you need, but you wouldn't want to be lugging it around for a long time. The weight of the unit on its own is a hefty 3.3kg; but with the power pack and leads, it climbs to an arm-wrenching, muscle-straining 3.75kg.

The unit submitted to *APC* for benchmarking was an engineering sample, so the benchmark tests (run under Windows 2000, to avoid as many driver conflicts and other problems as possible) are only an indication of how the finished product will perform.

The scores for Ziff-Davis' WinMark 99 benchmarks were high, particularly for the disk tests, indicating that the unit's hard drive is well suited to the intensive disk access demanded by many business, gaming and multimedia applications. The full test results can be found on this month's cover CDs.

The integrated Intel 82815 graphics processor has never scored highly in past benchmarks, but allied to 11M of system memory, it returned strong results — particularly the Video2000 benchmark score. This tests the general 2D display capabilities of a graphics card and display, including DVD MPEG decoding. The large and lush 15in TFT display proved excellent when we played a DVD on the system.

Sony has estimated the battery life of the notebook at up to four and a half hours, although at maximum grunt it lasted an impressive two hours and 19 minutes. However, the Vaio doesn't appear to take full advantage of the SpeedStep technology in the Mobile Pentium III chip, as running the tests again with the notebook in battery-saver mode only delivered an extra 20 minutes.

Darren Ellis

Pros Long battery life
Large, clear and bright display

Cons Heavy for a portable

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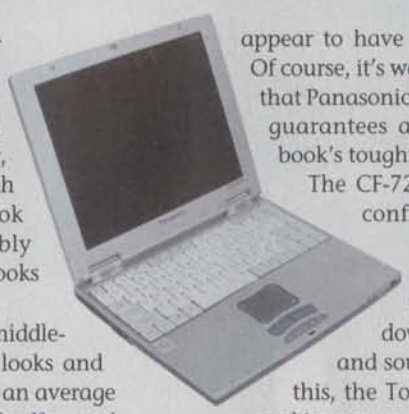
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Panasonic Toughbook CF-72



Panasonic has always marketed its Toughbook notebooks on their ability to handle just about anything you can throw at them. However, this durability comes at a high price. The average Toughbook will set you back considerably more than other brand notebooks with similar specifications.

The CF-72 is Panasonic's middle-range business Toughbook. It looks and feels only slightly tougher than an average notebook. A black plastic buffer-pad attached to each side of the lid protects the screen, which is always the most vulnerable part of a notebook.

Panasonic also claims that the CF-72 has been drop-tested from a height of 30cm, which effectively means that unless you walk like a gorilla, you can't drop it at all. What this test really measures is resistance to the bumps and scrapes associated with slightly rougher than usual day-to-day use. The spill-resistant keyboard is designed to protect against minor accidents — although the speakers above it don't appear to have much protection. Of course, it's worth remembering that Panasonic doesn't make any guarantees about the Toughbook's toughness.

The CF-72 has a hardware configuration almost identical to Compaq's Evo (see page 30), right down to the graphics and sound chips. Despite this, the Toughbook's benchmarking scores averaged between 5% and 10% lower than the Evo — not enough to make a real difference to most people. The only category in which the CF-72 scored significantly higher was battery life. It lasted about 10% longer than the Compaq. Full test results can be found on this month's cover CDs.

One of the CF-72's most serious shortcomings is its lack of any sort of LAN device — wired or otherwise. However, Panasonic emphasises that the notebook comes "wireless-ready". Free-roaming users will be able to add a LAN or GSM wireless device to it later this year. People who want basic LAN capabilities before then have to shell out for the optional modem/network combo card — a costly short-term solution if you plan to upgrade to wireless later on.

Bear in mind that Toughbooks aren't meant for the average city-bound notebook user. Most people don't have to worry too much about damaging their notebooks in the course of normal use. However, if your business involves a lot of travelling or your gear gets a moderate amount of wear and tear, then the CF-72 is worth considering. Mind you, there's always the option of a good-quality notebook bag.

Daniel Gardiner

Pros Designed to take rough treatment
Cons Expensive
Benchmarks slightly below average

Contact Panasonic
Phone 13 26 00
Online www.panasonic.com.au/toughbook
Price $7,999

Lexmark T620 with StapleSmart Finisher



Laser printers cost more to buy than inkjet printers of the same capacity, but cost far less to operate. The refill cartridges are cheaper and last much longer. Despite the initial outlay, they represent good value.

The Lexmark T620 is a new monochrome laser printer designed for workplaces with high print demand. Like the Optra C710 (see *APC* March, page 78) the T620 has a smooth, curved shape that looks good in office environments. The interior design is well thought-out too. It's easy to fix paper jams and the toner cartridge slips in and out easily.

The printer has a speedy 300MHz processor and 16M of RAM (expandable to 32M), which means it can print extremely fast — up to 28ppm. The maximum DPI is a fine 1,200 by 1,200, but this can be dropped to 300 by 300 for quick prints.

The unit is installed simply by plugging it in. Installing the drivers is usually easy too, but we had some problems installing them on the test Windows 2000 machine, as the drivers kept restoring to the printer default. It has USB or parallel connections on the rear, but a networked model (the T620n) is also available for an extra $900.

To test the T620, *APC* ran the same tests it used in the printer roundup conducted earlier this year (see *APC* March, page 74). A single sheet of differing type sizes and thicknesses was printed, followed by five sheets of a uniform type size. Print times were measured from the moment the software signalled that printing had started or when paper feed commenced (spooling time was ignored). Timing finished when the printed page was ejected.

The times for the T620 were very impressive; the first sheet came out in under 10 seconds and all five were done in 14 seconds.

APC also reviewed a T620 accessory, the StapleSmart Finisher. This is a separate unit that fits neatly on the top of the printer and collates and staples pages. In tests, the unit worked extremely well, but the driver problems made getting the attachment running properly difficult. However, once functional, the unit worked like a dream. It's smart enough not to staple single-sheet jobs, and it aligns the papers so that the pages are stapled neatly in the top left-hand corner.

The T620 can print from A4 to executive size and comes with a 500-sheet tray.

Darren Ellis

Pros Fast to print
High DPI
Cons StapleSmart Finisher is expensive

Contact Lexmark
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T620n: $3,667;
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Windows .NET Server

During all the hype devoted to Windows XP, little has been said about the Windows server platform, recently renamed Windows .NET Server from Windows 2002 Server (XP is the brand name for the desktop client). As we discovered, the changes range from noteworthy to revolutionary.

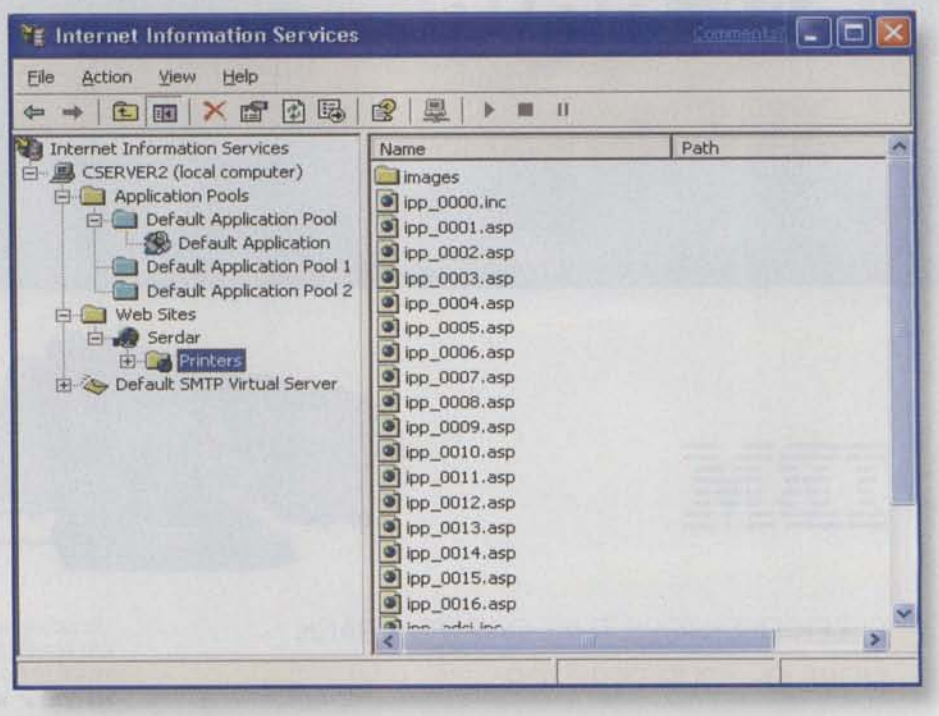
Installing .NET Server involves little more than booting the CD and going through a series of menus similar to those in the setup procedure for Windows 2000 Server. The graphical portion of the setup has been redesigned to resemble the setup process for Windows Me, including splashier screens and a bar which tells you the estimated time to completion of the installation. Total installation time was around 30 to 40 minutes, excluding a reformat of the system drive.

Once installed, booting into .NET Server is similar to — what else? — Windows XP. However, Microsoft appears mindful of its audience this time, since all of the Windows XP eye candy is turned off by default. After all, most server administrators don't give a hoot about pretty desktops.

Microsoft's Internet Information Server reaches revision 6.0 with the release of .NET Server. To IIS 5 users, it won't look very different, but the changes under the hood make it almost a new program. The biggest change is in the way application pools are handled. Application pools in IIS are a way of running sites in protected processes to keep them segregated. Applications are pooled either in the IIS process, in a single shared process, or in individual per-site processes. IIS 6 lets you create as many application pools as you want, totally separate from the sites, and applications can run in any of these in any combination. These new pools are referred to as Web gardens.

Using Web gardens, applications that leak or crash will self-restart and can be set to expire gracefully. They are then recycled into a totally new process (a great way to keep a slow-leaking test site from eventually bringing down the system!). Application pools are also designed to work better on multiprocessor systems, so that if a thread blocks up, it won't hold up the process. The system can also ping worker processes using an interval set by the user. If a process stops responding within the time frame, it can be killed. Worker processes can also be dedicated to a processor in a multiprocessor system, which is termed "processor affinity".

A possibly controversial change is the relocation of the queuing process for IIS (the program that accepts IIS requests) into kernel space, for the sake of speed and process allocation. The queue doesn't actually execute IIS requests, it just dispatches them to the appropriate worker process. If a worker process crashes, the queue launches a new worker and sends all requests for the dead process to the new one.



▲ IIS 6.0 lets you create application pools completely independent of Web sites, and contains intelligent technology for ensuring that your site's code stays up and running.

Active Directory (AD), one of the big selling points behind Windows 2000, has had a big boost in .NET Server as well. AD's implementation of LDAP now supports: protected connections as per RFC 2830; the VLV protocol, which allows intelligent browsing through subsets of very big directories; DNS debugging — apparently DNS configuration was difficult for first-time AD deployers; and more robust authentication between and within forests. The last allows users to certify and securely get to server resources when they're signing on in one forest and their credentials are in another. Kerberos or NTLM can be used for this authentication.

New Office back-end enhancement features appear in .NET Server under the name SharePoint. Office XP users can collaborate through a Web-based SharePoint server on Web sites, Word documents, databases, FrontPage Web sites — just about every type of Office document you can think of. The server can even automatically notify all participants in a particular project of changes, via email.

Many of the new features in XP appear in .NET Server too, such as Internet Explorer 6.0, the Personal Firewall and the enhanced network bridging and sharing features. The network features are especially useful on servers that function as routers or gateways to the outside world, and setting up one of these is a snap, thanks to .NET Server's new task-specific networking wizards.

My favourite miscellaneous feature is the built-in CD-R/CD-RW burning system — all you need to do is drag files to the CD-ROM, then when you're done, right-click it and hit Burn to CD. It makes archiving all those Web and system logs really painless.

Some of the niftiest additions will only work on hardware that supports them. An example is Hot Add Memory, which can add memory while the server is up and running without rebooting.

There are still a few things missing; for instance, the built-in disk defragmenter still can't defragment or move system files (you need a third-party utility for that). But this is a small quibble compared with what does come included. Too bad we won't see it all on store shelves until next year! Until then, save your pennies.

Serdar Yegulalp

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Imation SuperDisk 240M



Just when you think you've covered a subject exhaustively, someone goes and releases a new product. Such is the case with Imation's 240M SuperDisk drive, which arrived after this month's removable storage feature had been sent to the printers. However, newer doesn't necessarily mean better.

This is Imation's second shot at making a success of the SuperDisk and unseating Iomega's Zip drive as the de facto standard in personal removable storage. In its favour, the original SuperDisk had a capacity of 120M against Zip's 100M diskettes, as well as the ability to read and write conventional 3.5in floppies, which made the drive very appealing for owners of the floppy-free iMac.

The newest SuperDisk ups the storage ante to 240M, at a cost of $21 per diskette, and also supports the 120M platters ($16 each). The biggest development is that the drive can also format 1.44M floppy disks to a capacity of 32M. There are, however, catches. To start with, the 32M floppies will only work in the 240M SuperDisk drive — they're completely unreadable to a standard floppy drive. Also, writing to the disc can only be done with Imation's bundled SuperWriter utility, instead of the intuitive drag-and-drop method.

However, the real problem is that any time you want to add files to a 32M floppy, the drive rewrites the disk's entire contents — a slow and fiddly procedure which crawls along for about four minutes. And this happens every time want to add even a single bit to the disk. Matters aren't helped by the fact that the writing utility looks like something from the days of Windows 3.11.

At the 240M end of the copying spectrum, matters aren't much better. Shifting files to a 240M SuperDisk took just over 15 minutes, some three times slower than Iomega's competing Zip 250 drive (reviewed on page 74). It's also worth mentioning that the disk capacity is actually reported by Windows as 229M.

A final and quite literal shortcoming is the drive's stingy and next to useless 14cm USB cable. Imation had the sense to supply an extension cable, but it's still only a meagre 30cm.

SuperDisk drives have popped up in a number of notebooks, where they make great replacements for the floppy. For removable storage fanatics, however, there are definitely better and faster options on the market — turn to page 68 for your full fix.

Alex Kidman

Pro	Works with Windows and Macs
	Gets 32M out of a regular floppy
Cons	Slow and fiddly operation
	Ridiculously short USB cable

Contact Imation
Phone (02) 9479 9086
Online www.imation.com
Price $379

TDK VeloCD



TDK's VeloCD adds a hefty 24x CD burner to your system, and even better, it's BURN-Proof (see *APC* April, page 98, for an explanation of BURN-Proof technology). That's a potent combination — pretty close to CD-burning nirvana at present.

Setup of the VeloCD is standard for an internal CD drive, but an excellent installation sheet is also included for inexperienced users. It won't make you feel less queasy about opening up your system, but it guides you through the process in a reassuringly logical manner.

Three software packages are included with the VeloCD. For the burning component, TDK has gone with Ahead Software's NERO, an excellent package that's finally getting a foothold in the bundling market. The package is supported by TDK Mixmaster, an all-in-one audio playing and ripping tool that is copyrighted to Ahead software, but has more than a touch of Winamp about it. Mixmaster's interface is initially a little confusing, but different skins can be used for it. Unfortunately, it doesn't support Winamp skins.

Nothing is more likely to raise the ire of an *APC* journalist than empty marketing hype. So, when we saw the claim "Burn entire CDs in less than four minutes", we were suspicious. To test the drive's capacity to deliver on its claim in less than ideal circumstances, an aging Pentium II, 333MHz machine with 128M of RAM was used for the last round of CD-RW testing (again, see *APC* April, page 98). The results were impressive, although the four minutes and nine seconds our test burn took were slightly over the advertised figure.

Audio burning is also quite speedy — an average of six minutes and 29 seconds per disc. Because the VeloCD is BURN-Proof, we were really able to tax its capabilities, so we performed a direct CD-to-CD copy whilst running other applications. The VeloCD passed with flying colours; it took 40 minutes to copy our disk with about 30 buffer losses. This would usually translate into 30 dud CDs, but instead we ended up with one perfect copy.

The package includes three blank CDs which match the capabilities of the drive: two 80-minute 24x CD-Rs and one 10x CD-RW disc. These discs are the only ones we've come across that are rated for 24x burning, but our tests with other discs produced acceptable results.

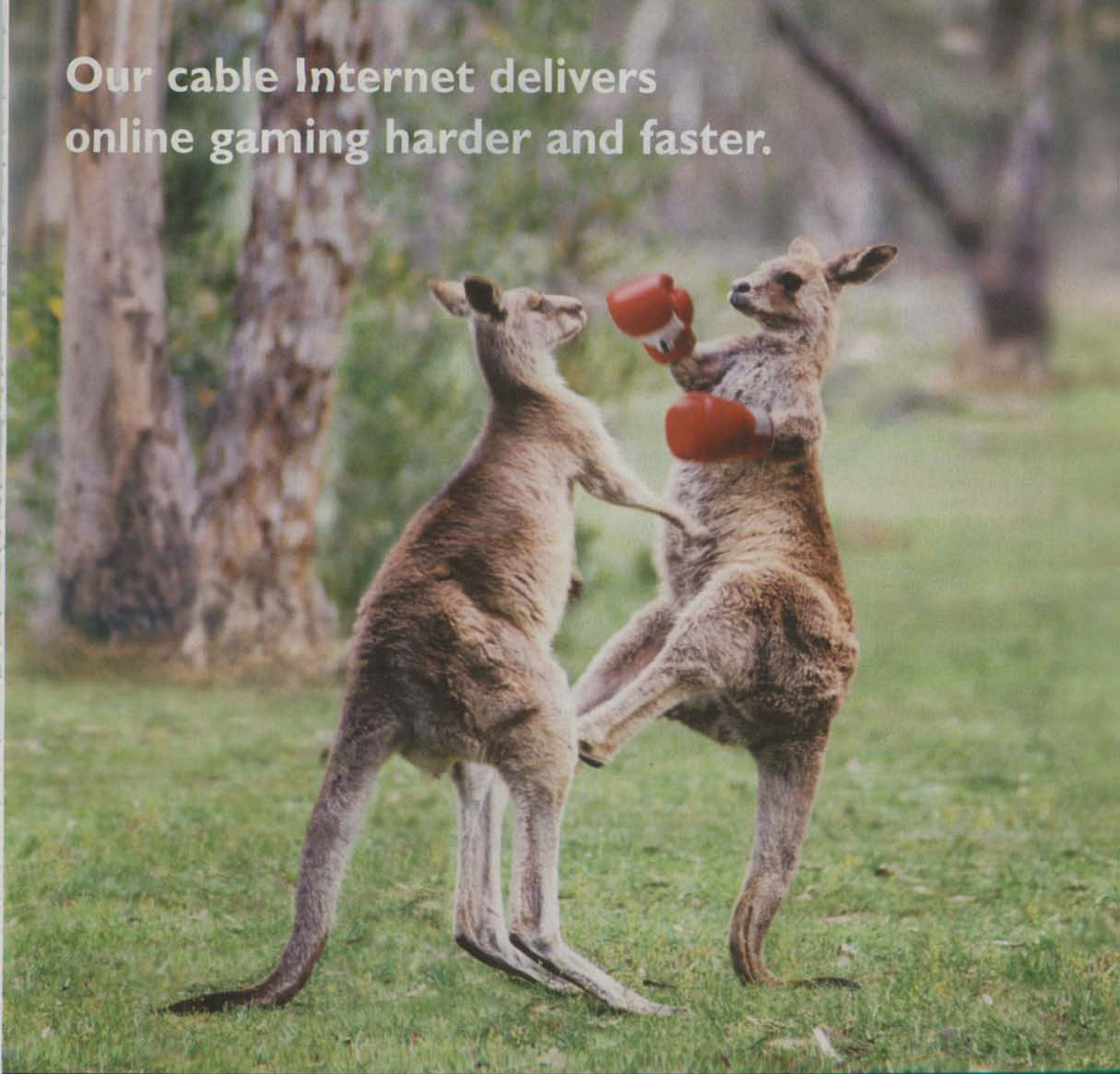
The VeloCD is an attractively priced unit that just about lives up to its advertising hype — a refreshing change.

Alex Kidman

Pros	Fastest CD burner around
Cons	Getting 24x rated discs could be tricky

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[#]Comparison is based on the maximum speed possible on a 28.8kbps modem and actual tests performed on the Optus@Home network. Speed can vary depending on your computer's configuration and capacity, the capability and load on the sites visited, the variable nature of the Internet and amount of simultaneous usage on the Optus@Home network. [*]Optus@Home is available in Optus cabled areas in Sydney, Melbourne & Brisbane. For technical and commercial reasons not all homes can be connected to the Optus cable or service. The Optus@Home service is subject to the Customer Terms and Acceptable Use Policy available from www.optushome.com.au/obligations.html Optus@Home is a trade mark of Excite@Home Australia Pty Ltd.

OPH 5551/K/AP

Intel Pocket Concert audio player



If Intel were to choose a theme song for its new Pocket Concert digital audio player, it would be Abba warbling "Thank you for the music". With 128M of flash memory on tap, the slick-looking Pocket Concert can hold a solid two hours of your favourite tunes ripped as 128Kbit near-CD stereo MP3s, and twice that again if you use the tighter compression afforded by Microsoft's WMA format.

Intel's first foray into portable audio is a crafty move. The silicon sovereign is keen to see the personal computer play a greater role in daily life — a role to which a digital audio player is perfectly suited. And as one of the world's largest producers of flash memory, Intel can afford to offer twice the memory that's available on most competing devices.

Once you reach that 128M limit, however, all you can do is stab the replay button and listen to the same songs all over again, because the Pocket Concert doesn't have an expansion slot for adding CompactFlash or SD memory cards. How important this is depends on your listening habits. If you're happy to rip in WMA, you'll have four hours at near-CD quality, and up to eight hours at something closer to FM radio reproduction. Your other option is to switch on the Pocket Concert's FM tuner and choose between the 10 preset stations.

The player's audio output is superb, thanks to an 11mW amplifier, which blasts away the 5 to 7mW amps of most portable MP3 players. Battery life is rated at up to 10 hours for playing digital audio tracks or 16 hours of FM radio, but disappointingly, considering its high price, the Pocket Concert doesn't include rechargeable batteries.

The supplied headphones are quite comfortable to wear for a long period of time if you're stationary, although if you intend to hit the jogging trail you'd be better off buying a smaller pair that fit inside the ears. And the manual controls on the player are outstanding — a modest three-button arrangement that's simple and easy to use.

The bundled software includes a full version of MusicMatch Plus for ripping tracks from CDs, and Intel's manager software to shuttle songs between your PC and the player. The only surprise was that you can't transfer MP3 files from the player back to the computer, although this isn't likely to be a problem for most users.

Matt Overington

Pro	128M memory
	Easy to use
	Great software bundle
Cons	No memory expansion

Contact Intel Australia
Phone 1300 363 018
Online www.intel.com.au
Price $699

Multi-Format Memory Card Reader



You've got your digital camera. You've got your portable MP3 player. You've got your handheld. In a perfect world, they'd all use the same slab of solid-state memory for saving pictures, tracks or programs. But this isn't a perfect world, so you're stuck with a clutch of different card formats, all of which hold data that must at some stage make its way back to your desktop or notebook PC.

ACOMdATA's Multi-Format Memory Card Reader doesn't end the card shuffle, but it does the next best thing — it lets your Windows PC or Mac read the four most common card formats. The front panel of the card reader has slots for the popular CompactFlash favoured by Windows handhelds and some digital cameras, the matchbook-sized SmartMedia card commonly found in MP3 portables, Sony's proprietary Memory Stick, and the diminutive MMC/SD wafers seen on the latest Palm handhelds and Toshiba notebooks.

When connected to your PC, the Multi-Format reader creates four removable disk drive icons, one for each card slot. This makes it a snap to move files onto your hard drive, with no need to connect the 'parent device', such as your digital camera or MP3 player, to the PC. Just pop the memory card into the appropriate slot and treat it as you would a floppy disk. You can also transfer files from one card type to another, although this process would be easier if each drive bore a unique icon, such as a glyph of the card, instead of a generic drive icon inscribed with a minute label.

The unit is easily portable, being slightly smaller than a Zip drive and drawing power from your computer's USB socket. The only catch is that to read IBM's 340M or 1G CompactFlash Microdrive you'll need to spring for the optional AC adaptor. *APC* liked the review product so much that we bought one to keep. You don't get a better endorsement than that!

David Flynn

Pros	Reads the most common memory card formats
	USB connect to Windows or Mac
Cons	Requires power supply for Microdrive cards

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CS0667/1

Intermec Model 70



Another entrant in the PocketPC market, Intermec's Model 70 sits happily in the middle of the road when it comes to size, weight and features. Weighing approximately 150g, the Intermec is encased in solid plastic, and is small enough to fit comfortably into the hand. There are six configurable buttons on the face, in addition to a headphone socket and microphone for voice recording, an infra-red port, and a sheath for the stylus.

The boxed components are extremely basic, with neither a CD nor a good manual to accompany the device, although the included Quick Start Guide is concise and useful, especially as it points you towards relevant Web sites for extra information. As a matter of course, you have to download Microsoft's ActiveSync software in order to get the RS-232 (serial) interface working with your desktop PC, which is going to be a problem if you don't have Web access on your desktop or notebook computer.

Like all handhelds based on Windows CE 3.0, the Intermec includes Microsoft's Pocket Office suite (bonsai Word, Excel, Outlook, Internet Explorer and Money), a multimedia player and ebook reader.

The unit is fast and responsive, due to the sensible partnering of a 206MHz RISC chip (Intel's StrongARM processor) and 32M of memory.

The machine has a CompactFlash slot on the top for adding extra programs, storing large data files or backing up data directly to the CompactFlash card while you're on the road, which means that you're not forced to dock the Intermec into its own cradle to store data in the long term.

The only disappointment in what is otherwise an outstanding digital organiser is a low-contrast monochrome display that makes the unit almost impossible to use when there's not much light.

Approximately 10 hours of battery life can be gleaned from the rechargeable 3V lithium ion battery, which is recharged either while the Model 70 sits in its desktop docking cradle or by directly connecting the power adaptor to the handheld.

In most regards, the Intermec Model 70 is all you could want from a Windows handheld: fast, efficient, and extremely easy to use. The performance of the screen could be improved, however, and the lack of a USB interface can be frustrating.

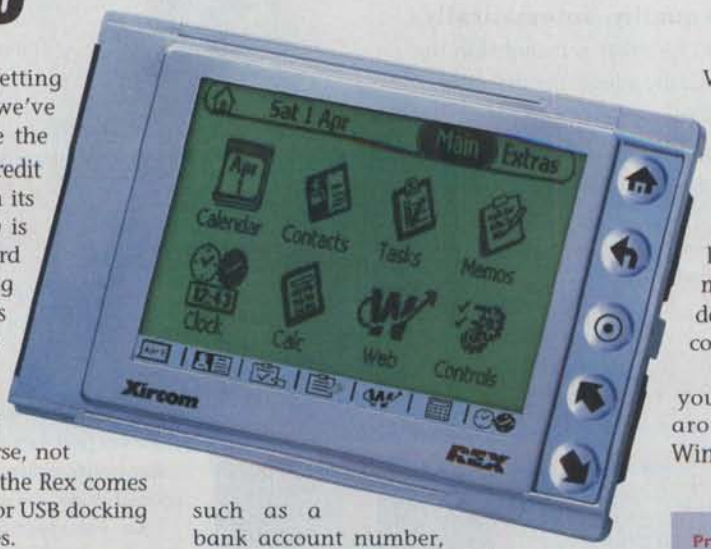
Matt Overington

Pros Robust
Responsive

Cons Poor monochrome display
No USB synchronisation

Contact Intermec Australia
Phone 1800 333 120
Online www.intermec.com
Price $840

Rex 6000



Personal organisers are getting smaller every day. Now we've even got 'micro PDAs' like the Rex 6000, the latest in the credit card-sized Rex line. As with its predecessors, the Rex 6000 is built on a standard PC Card platform, so it can plug directly into your Windows notebook to synchronise its diary, address book, memo jotter and to-do list against Outlook or the bundled IntelliSync desktop. Of course, not everybody has a laptop, so the Rex comes with your choice of a serial or USB docking station for desktop machines.

The most significant improvements to the Rex 6000 are a generous 2M of storage, and the introduction of a touchscreen for data entry, with a pop-up keyboard that makes it much easier to enter or modify data.

The Rex also has a world clock and calculator, both long overdue, although there's still no search function. If you have scores of notes and you're looking for a specific item, such as a bank account number, you'll have to scroll through every note to find what you're after. On any other PDA, this common procedure is a snap.

Don't go looking for the wealth of third-party software available for the Palm or Pocket PC handhelds — the choice is limited to a mere handful of applets. But you can download clippings of news and information from the Internet through the free rex.net service.

While the diminutive size of the Rex 6000 makes it very portable, there are several drawbacks. The touchscreen is not very responsive, and it feels as if it could break at any time. The onscreen keyboard is hard to use without the stylus, and even then, it's not recommended for entering large amounts of data. The Rex 6000 is also very slow compared to conventional handhelds.

Overall, the Rex 6000 is good value if you want an affordable way to carry around diary-type data from your Windows desktop or notebook.

Ronald Rosenbaum

Pros Small size
Good data synchronisation

Cons No search function
Data entry is difficult

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Image Optimiser can automatically "correct" low-resolution Internet images up to the printer's maximum resolution. Turn photos into simulated illustrations and create sepia hues, print banners up to 6 A4 pages long, overheads and even T-shirt transfers.



Duplexing, high speed blacks.
The driver allows manual duplex. For B&W only, an optional dedicated black ink cartridge with 128 print nozzles offers print speeds up to 5 pages per minute.[1]



Reduced operating costs.
Super Economy mode improves operating economy without the definition sacrifices common to many draft modes. It effectively quadruples output from both the black and colour cartridges.[3]

5 times the colour.
Optional PhotoRealism™ inks vary the saturation per dot. This produces up to five times as many colour combinations as conventional CMYK inks for better half-tones and less grain.

PhotoRealism produces colours between colours.







Built-in parallel and USB interfaces for Windows and Mac.[2]

USB

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CS0667/2

AG Neovo X-174



LCD screens are undeniably superior to conventional CRT monitors; they offer greater clarity and stronger colour reproduction, draw less power, and are less likely to produce eyestrain or headaches. However, few pay as much attention to aesthetics as AG Neovo has with the X-174. This 17.4in black beauty stands out like a Porsche 911 at a Morris Minor convention.

The stunning design of the aluminium casing and the black optical glass filter that covers the face of the LCD membrane are impressive, and the X-174 is as good as it looks in terms of performance. Colours are vivid and the display remains sharp — even at the native resolution of 1,280 by 1,024, small fonts were clear enough to read without straining the eyes.

These results are due in part to the multilayered glass filter which protects the LCD panel as well as magnifying the onscreen images. The filter also helps increase the viewing angle of the screen to a generous 160°.

The X-174 has dispensed with some of the more common luxuries offered by competing manufacturers, such as USB support and audio speakers. Instead, the focus is on connectivity for serious users — it has four ports for the video pro: a 15-pin mini D-Sub analog port, a 29-pin Digital/DVI port, a 4-pin mini Din S-Video port and a video-in RCA jack port. This makes the monitor compatible with everything from Windows and Mac machines to DVD decks.

Available separately is a TV tuner with remote control, which costs $245. In keeping with AG Neovo's attention to style, the tuner is mounted on the rear panel of a picture frame — so a vertically oriented, standard-size photograph can conceal the electronics. The frame and tuner then sit innocuously on your desktop.

March Stepnik

Pros Beautiful design
Large viewing area
Cons No USB ports or built-in speakers

Contact Camcom International
Phone (02) 9816 3988
Online www.camcom-international.com
Price $3,800

Specifications
Screen size 17.4in (44cm) diagonal
Active area 345.6 by 276.5mm
Pixel pitch 0.27 by 0.27mm
Pixel format 1,280 by 1,024 vertical stripe
Horizontal frequency 30 to 80kHz
Vertical frequency 50 to 75kHz
Weight 9.5kg (gross)
Dimensions 432 by 407 by 175mm
Tilt angle 0 to15°

Nintendo Gameboy Advance

Recently launched on the Australian market with a truly bizarre series of television spots (but a relatively small set of games), the Gameboy Advance literally marks a change of direction for Nintendo, featuring a horizontal screen (40mm by 61mm) for in-game display. It's also a touch larger than its Gameboy, Gameboy Pocket and Gameboy Color predecessors. The control buttons are of the familiar Nintendo cross-stick variety for movement, with four 'action' buttons. Two of the buttons could have been yanked from a standard Gameboy and are on the left side of the system, while two analog-style buttons are on the top of the unit. The Gameboy Advance is also intended to act as a controller for Nintendo's upcoming GameCube, although that system uses a controller with many more buttons.



Nintendo's hype for the Gameboy Advance centres on the unit's impressive display capabilities. It's a pity, then, that the screen is so dark. Nintendo decided against fitting a backlight in an effort to maximise battery life from the AA cells. This does give the system a battery life of about 10 hours, but it still falls quite short of Nintendo's claim of 15, and under any but the best light conditions, it's very hard to see the onscreen action. LCD screens that forgo backlighting all suffer the same problem — try looking at your digital watch in a dark room and you'll see what I mean. A watch, however, is something you glance at for maybe a second, while a games machine is something you're likely to stare at for hours on end. The result is sore eyes, not to mention a sore neck due to having to tilt the unit to make the best use of the available light. No doubt Nintendo (or a third party) will quickly develop a light adaptor similar to the ones already available for the older Gameboy models, but it's still something the developers should have thought of to start with.

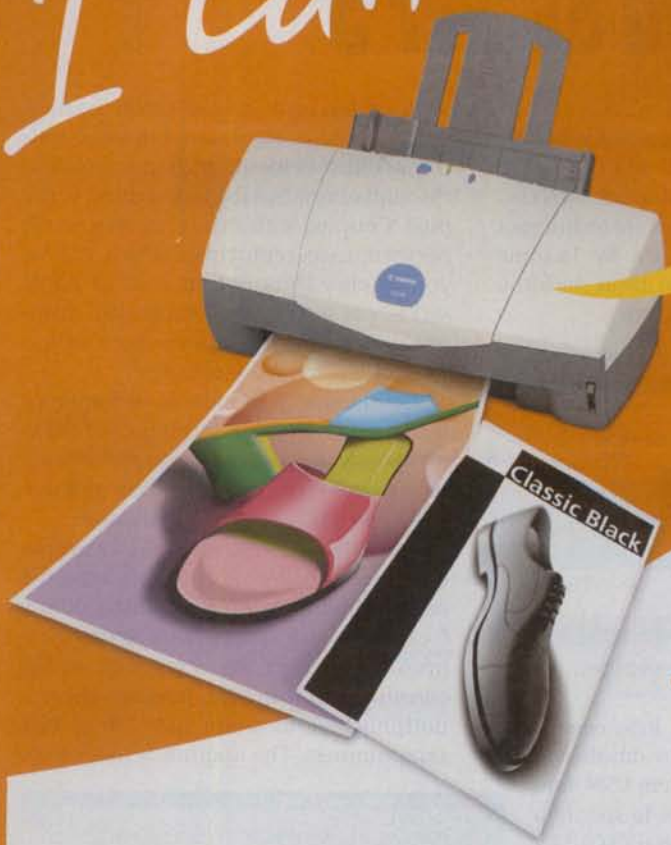
Nintendo's choice of launch games is somewhat underwhelming. We examined Super Mario Advance, basically a rejig of a Super Nintendo version of Super Mario Brothers 2, which itself was a re-release of an even earlier game. It's still good fun, but chances are that if you're a console junkie, you've already played it. We also played F-Zero: Maximum Velocity, another re-release of an earlier title. Both games looked superb for a portable machine — just as long as the light was right.

Alex Kidman

Pros Coolest portable gaming technology short of buying a notebook PC
Cons Lack of backlight and launch titles

Contact Nintendo
Phone 1300 362 746
Online www.nintendo.com.au
Price $199

I can...



Very smart monitoring of absolutely brilliant colours.

All inks have a higher optical density to produce more vivid, natural looking colours. They are contained in separately replaceable transparent ink tanks, and each is separate from the print head. The printer driver alerts you when they are low. You replace only one colour at a time, and because the standard inks are optimised for low cost plain paper, you can keep operating costs down.



Light



Light

Smart monitoring system.

...do anything you want, brilliantly.

1440 dpi, variable ink drop sizes.
Quality is exceptional, even on low cost plain paper with resolution up to 1440 x 720 dpi, plus Drop Modulation Technology™ with variable ink drop sizes. B&W is enhanced using high optical density black pigment inks.



Optional PhotoRealism.™
Special inks vary the saturation level per dot (e.g. 33%, 67%) for up to 5 times as many colour combinations as conventional CMYK inks. The result is smoother tones with vastly reduced grain.



PhotoRealism produces colours between colours.

Brilliant Colour Inks

Better print quality, automatically.
Photo Optimiser adjusts for defects in exposure, highlights and shadows while Automatic Tone Control reduces the 'colour noise' from compact digital camera images. Image Optimiser prints low-resolution Internet images up to the maximum resolution supported by the printer.



High speed printing.
Large print heads and bi-directional printing produce up to 4 colour pages per minute. An optional, dedicated black ink cartridge is capable of B&W speeds up to 9 pages per minute.[2]

4 ppm colour

9 ppm mono

Parallel and USB interface. Both ports are built-in for Windows and Macintosh.[1]

USB

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

3-YEAR WARRANTY OPTION



Turn your printer into a 720 dpi colour scanner with the optional scanner cartridge, pictured left.

S400

colour Bubble Jet™ printer

Just $259[RRP]

You can...

Canon

Price shown is recommended retail price including GST. Canon® is a registered trademark and Bubble Jet, Drop Modulation Technology and PhotoRealism are trademarks of Canon Inc. Microsoft®, Windows® and Windows NT® are registered trademarks of Microsoft Corporation in the US and other countries. Apple®, Macintosh®, Mac® and Mac® OS are registered trademarks of Apple Computer Inc in the US and other countries. All other trademarks are the property of their respective owners. 1. Printer driver support is provided for Windows® 95, Windows® 98, Windows® 2000, Windows® Me, Windows NT® 4.0 for the parallel port and pre-installed Windows® 98, Windows® 2000, Windows® Me and Mac® OS 8.1+ or 9.X using the USB port. 2.Print speeds may vary with the content of the document and the processing speed of the host computer. B&W print speeds require the optional BC-30e black cartridge. Specifications are subject to change without notice. Canon Australia Pty Ltd ABN 66 005 002 951.

C50667/3

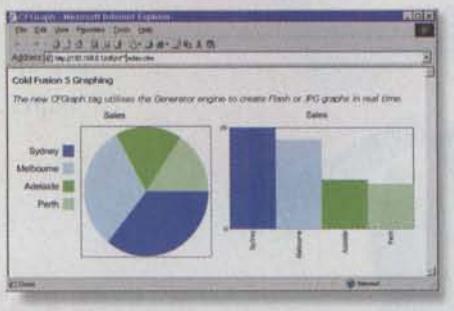
Macromedia ColdFusion Server 5

Although best known for its Web design products, such as Fireworks, Flash and Dreamweaver, Macromedia has been edging into Web server technology. At first, this was a tentative move with the release of Drumbeat, an Active Server Page (ASP) editor. Then the release of UltraDev broadened Macromedia's market by targeting users of ASP, Java Server Page (JSP) and ColdFusion with its already popular Dreamweaver product. Now, with the recent acquisition of Allaire, it is in control of two of the major players on the Web application battlefield — JRun and ColdFusion. Although Macromedia appears to be employing JRun for the development of its own Web site, information on ColdFusion is much more prominent on the site.

ColdFusion 5 attempts to cater to those situated at the two extremes of Web application development. On the one hand, Macromedia is tempting developers and their managers with promises of increased productivity and speed of delivery. On the other hand, systems administrators and IT managers are being reassured with claims of improved reliability and compliancy.

Web developers are repeatedly drawn to ColdFusion because it is a tag-based language and reasonably familiar to anyone who has worked with HTML. By 'wrapping up' most of the system calls and taking the programming out of server scripting, ColdFusion is a fast and easy way to build dynamic Web applications — possibly even the fastest, as Macromedia claims. The downside to this tactic is the cost of adaptability and customisation inherent in any software 'wrapper'. To Macromedia's credit, ColdFusion, especially this version, keeps these costs to an absolute minimum and provides extensibility should its built-in behaviour be insufficient. Version 5 allows declaring user-defined functions, and has vastly improved support for COM object connectivity. In fact, *APC* was able to connect to several custom COM objects using CF-OBJECT without any problems — unlike earlier versions. Support for Servlets, Java-Beans and CORBA remains the same as for 4.5.

A feature that truly stands out in the new version is the inclusion of charting and graphing capabilities. The Macromedia Generator server and JRun engine are included in the distribution, which explains why the ColdFusion 5 installer is 80M. Now, it is possible to create pie, line and bar graphs from any query with the use of a single tag — CFGRAPH. The results can be output as Flash, JPEG or PNG files and, if Flash is used, can include rollover effects and drill-down hyperlinks to embedded graphs. This will come as a relief to anyone who has battled with custom tags, COM objects or other techniques for generating images on the fly. In some cases, this will no doubt be a deciding factor in choosing ColdFusion.



▲ New graphing and charting capabilities

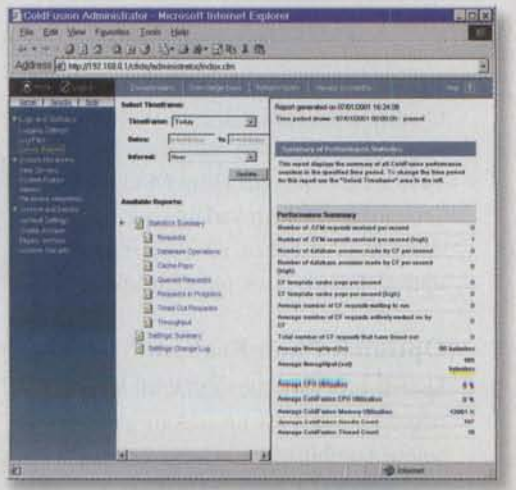
Another new feature, long overdue, is the ability to connect to databases not explicitly declared as system DSN data sources. It is now possible to specify a driver connection string in a CFQUERY tag. *APC* could not get this feature to work in the downloadable trial version, but it means that access to the server's ODBC control panel or ColdFusion administrator is no longer required when building database-driven pages.

Custom logging has also been added, making it simple to log any type of activity to a text file. Instead of relying on the resource-intensive CFFILE tag to open and append to text files, the new CFLOG tag can be used to do this automatically. It has options to include the thread ID, date, time and application name. Note that, for all these new tags and parameters, an update has been made freely available for ColdFusion Studio 4.5.2.

Another new addition to ColdFusion is Log File Analysis. Don't get too excited — this refers only to ColdFusion log files, not server logs. However, it is still a welcome improvement, making scrolling through enormous log files a thing of the past. Coupled with this is the new server performance reporting, which allows you to view information such as pages served per second, CPU usage and memory utilisation at a glance from within the ColdFusion Administrator.

ColdFusion 5 introduces performance features such as graph caching, a reduction in memory usage, application monitoring, server error alerting, and improved scalability and hardware load distribution.

At first glance, it seems Macromedia are targeting Web developers who are either already using ColdFusion or are looking to get started with server programming. With the exception of the charting and graphing features, there is nothing here to tempt ASP, JSP or PHP programmers. The upgrade is likely to be most appealing among those who manage high traffic sites and need the performance improvements, and for developers who have been frustrated by the lack of support for 'DSN-less' data sources or custom function declaration.



▲ Log analysis and server statistics



▲ ColdFusion Studio 4.5.2 update

Daniel Potts

Pros Rapid and reliable Web development

Cons Expensive compared to main competitors

Contact Macromedia Asia Pacific

Phone (03) 9853 0900

Online www.macromedia.com/ap

Price $3,300; upgrades: $1,650

I can...



A smart ink monitoring system alerts users when a colour is running low. Individual transparent ink tanks for all colours are separate from the print heads, significantly reducing operating costs and allowing you to replace only the empty tank.



...print very fast in brilliant colour.

Introducing 6 absolutely brilliant colours.
The S450 uses Canon's new high optical density inks in either of two configurations for better, more vivid colours than ever before. The standard inks are optimised for superior plain paper quality, while the optional 6-colour PhotoRealism system is ideal for higher paper grades. Reproduction is amazingly life like with smooth tonal gradations, even in difficult to reproduce shades.

Brilliant Colour Inks



Separate ink tanks.

Better print quality automatically.
The printer control software helps you maximise print quality. Photo Optimiser adjusts for defects in exposure, lighting and colour while Automatic Tone Control reduces the colour noise often common to compact digital cameras. Image Optimiser prints low resolution Internet images up to the maximum resolution supported by the printer. All functions can be used in automatic mode.





Parallel and USB interface. Both ports are built-in for Windows and Macintosh.[2]

USB

Advanced print head system, fastest in its class.
Multi-nozzle dual print heads combine with bi-directional printing to deliver high volume ink output fast. This results in monochrome text speeds of up to 10 pages per minute, and colour printing up to 7 pages per minute, making the S450 the fastest printer in its class.[1]

7 ppm colour

10 ppm mono



An optional scanner cartridge delivers resolutions up to 720 dpi.

S450
colour Bubble Jet™ printer
Just $329 RRP*

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

3-YEAR WARRANTY OPTION

1440
dpi plus Drop Modulation Technology

1440 dpi, variable ink drop sizes, blacker black.
Quality is exceptional, even on low cost plain paper, with resolution up to 1440 x 720 dpi plus Drop Modulation Technology™ variable ink drop sizes. B&W correspondence is enhanced even further thanks to new, high optical density black pigment inks for superior print quality.

You can...

Canon

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Adobe PageMaker 7

APC tested PageMaker 7 in the late beta stage, and it looks solid enough to tempt those using an earlier edition of the layout program to upgrade.



An interesting addition is the mail merge-style feature Data Merge, which imports data from spreadsheet, database or comma-separated TXT files into PageMaker templates. The entries can be placed inside the document, formatted and previewed before the data is merged. Graphic images associated with each entry are also imported, but this is less painful if they've first been correctly sized for the page layout.

Data Merge is also useful for personalised marketing flyers. Having an existing database helps, but creating one from scratch should be easy for the business professionals Adobe is now targeting.

The feature's main limitation is that it only works with text and static graphics. This means that the colourful graphs and charts so easily generated within Excel cannot be imported.

Native PhotoShop and Illustrator files can be placed on to the page, and images created in either program do not have to be flattened or saved as TIFF or EPS files. PhotoShop files are imported with their layers intact and automatically updated if changes are made to the original file. You can also bring in EPS files saved as Adobe PostScript 3, so it's possible to print and perform in-RIP separations on PostScript 3 devices.

PageMaker 7 also imports Adobe PDF 1.3 and 1.4 files, as well as PDF files created by PhotoShop and Illustrator. The program doesn't come with a full version of Adobe Acrobat, but it includes Distiller 5, which can output to PDF and offers a more compact PDF format than Distiller 4.

PageMaker can also export to HTML, but it's restricted to a limited range of options and approximate page layout. It's necessary to make changes to most PageMaker documents to ensure matching HTML code, or to tweak the outgoing code using an HTML editor. A final output option is exporting as a PDF 'eBook' suitable for handheld devices.

PageMaker 7 runs on Mac OS 8.6, 9.1 or OS X Classic, and Windows 98 or later; it's compatible, but not certified, with Windows 2000.

New users might find the $1,299 price tag a bit steep, but the upgrade price of $194 should make this a no-brainer for anyone running earlier versions of PageMaker.

Richard Price

Pros Data merge facilities
Uses PhotoShop and Illustrator files
Cons Limited HTML export

Contact Adobe
Phone 1300 550 205
Online www.adobe.com
Price $1,299; upgrades: $194

Balthaser:Fx

Balthaser:Fx is an online Web site development tool which requires only a Flash-equipped Web browser and a broadband Internet connection. The interface has been built entirely using Macromedia Flash, but it can be used to access large libraries of images and effects on the server. Because the libraries are stored remotely, the broadband connection is a definite requirement. The Web sites that are created using Balthaser:Fx are Flash files, and once they are complete can be uploaded from within the application directly to your server.

Getting started is simple. After logging in, you can create new projects or open existing ones from the main menu or 'Lobby'. You have four tool panels and four drop-down menus. Everything is drag-and-drop and, because this is Flash, there are no hidden tools such as right-click menus. The Objects panel gives you quick access to the libraries of clipart, images, vector graphics, buttons, navigation menus, animations, audio and text effects. These can be dragged straight into the work area, moved around and resized. Objects on the canvas can then be selected using the Layers panel



and moved around the layer hierarchy, as well as along the timeline. An object can be manipulated using the Controls panel, which adapts to provide options specific to the type of object you are working with. This versatility makes Balthaser:Fx very easy to learn and fast to use.

One of the advantages of Balthaser:Fx is that it doesn't require additional software installation, which minimises problems with licensing and upgrading. Sites can be updated from any computer with a browser and a fast connection. Designers who don't have the skills or the resources to work with Flash can now produce high-quality Flash sites. However, you must be online to use the software, and you are limited in what you can do within the Balthaser:Fx library. You can upload your own images, but none of the advanced features of Flash are available and customising effects isn't possible. You can upload your own Flash files, but this would defeat the purpose of using a remote Flash package.

Balthaser:Fx isn't meant to be a Macromedia Flash substitute, but it lets you create a high-impact site quickly and it will only cost you $US199.

Daniel Potts

Pros Fast to use
Inexpensive for single use
Cons Must have broadband connection
Limited scope

Contact Balthaser Online
Phone N/A
Online www.balthaser.com/fx
Price Single-scene project: $US49;
Multi-scene project: $US199

I can...

Super fast, fast mode.
A special fast mode combines an extra large print head capable of up to 12 million ink ejections per second with four drive motors. The paper feed is up to 70% faster, and is enhanced by a 20% greater data compression ratio. This allows fast mode to print up to 15 monochrome pages (text), and up to 10 colour pages per minute.[1]



10 ppm colour | 15 ppm mono

...print up to 15 B&W pages per minute.

5 pico-litre drops for 2400 dpi.
The S600 uses MicroFine Droplet Technology to precision-place extraordinarily small ink drops at resolutions up to 2400 x 1200 dpi.

LASTS UP TO 25 YEARS[2]

Better colours that last longer.
The S600 inks produce more vivid colours for improved reproduction on plain paper, and deliver sharper, blacker rendering of monochrome text. The ink range also offers vastly improved light fastness. In a simulated fading test, they have been shown to last up to 25 years using ISO standards for levels of acceptable fading when printed on Canon Photo Paper Pro.[2]



Smart ink monitoring.
Inks are contained in separately replaceable transparent ink tanks, and each is separate from the print head. The monitoring system alerts you when they are low, so you replace only one colour at a time.



Image simulation

Original print *S600* *Conventional*

S600
colour Bubble Jet™ printer
Just $599[RRP]

USB

Parallel and USB interfaces are built-in for Windows and Macintosh.[3]

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

3-YEAR WARRANTY OPTION

Resolves speed vs. quality issues.
The S600 also features a special draft mode. Slightly slower than fast mode, it combines high speed, with ink conservation, while resolving the quality issue common to conventional draft modes. New head design and Precision Colour Distribution Technology improve colour consistency while producing high-density, high contrast prints and still achieving B&W speeds up to 12ppm.[1]

You can...

Canon

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CS0445/5

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DVD disputes hit home

Stop, thief

I read with great interest "DVD zoning war heats up" (*APC* August, page 22), but I think the article missed one serious issue. In this ever-shrinking world, a lot of us travel and work overseas for short or long periods of time. I have spent the past four years working and travelling throughout Europe and the US. As a huge movie buff, I have collected a substantial DVD collection from various regions (including regions 1, 2 and 4) — all purchased legally within the country of origin. So why am I made to feel like a criminal when I ask if a player is multiregion? If the region coding system is to continue, I think distributors should provide an exchange service for these discs. I know there is little chance of this happening, but it really gets under my skin that I am expected to bin thousands of dollars worth of legally purchased discs and get the local region version. It really suggests a Big Brother mentality. It is strange that in a global environment such a localising concept has been introduced.

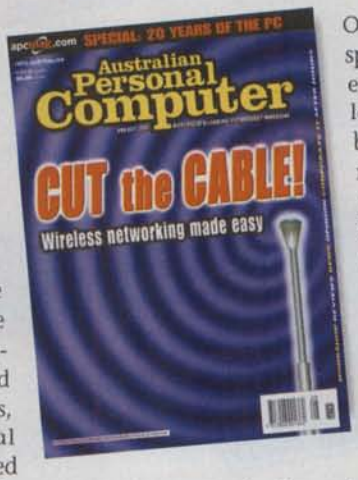
Mark Bowes
Brisbane, Qld

Letter of the month

The most interesting letter sent in during the month of September will win its writer a free copy of Microsoft Office XP Professional, with the new 2002 versions of Word, Excel, Outlook, Powerpoint and Access. Worth $699, this pack could be yours for free. The winner of this fantastic prize will be published in *APC* November. This month's winner is Mark Bowes.



Licensed to what?



During the recent software piracy truce (*APC* June, page 24), we carried out software audits for a number of customers. The experience has left me wondering just what constitutes a licence. In most cases, customers purchased the licences for software which comes either preloaded or shrink-wrapped with a PC. In some cases, hundreds of identical workstations are supplied at once and the shrink-wrapped software comes packed 50 to a box. To save time installing the software, the customer often uses one CD on every workstation, or uses disk imaging software to create identical copies for multiple workstations. They store the "certificate of legitimacy" (which is the only serialised document in the wrap) and file a single copy of the licence agreement for their records (and a couple of CDs for backup).

The remaining manuals and CDs are stored or thrown out. When a CD becomes difficult to read, they may copy the CD to guarantee that they have a backup. In the case of preloaded software, the software is already on the hard disk, but a CD is supplied as well. At the end of the day, all their installed software effectively has the same activation key or serial number.

So, what constitutes a licence? When we asked Microsoft, we were advised that we needed three components to prove a valid licence: the one-page licence agreement, the "certificate of legitimacy" and the CD. However, Microsoft also has other licensing arrangements, such as company-wide licences and Microsoft-certified partners. I feel that documents, manuals and CDs that are not serialised do not constitute a licence.

A unique licence number on a certificate of legitimacy ought to be sufficient proof. No doubt other suppliers have their own ideas. Are there moves to simplify this situation and have a common approach to proof of licence?

Theo Hooft
Ryde, NSW

Standard response

Our company needed a high-speed Net connection, as it was essential to our business. I looked into Telstra's broadband plans for small businesses but they seemed rather pricey for a capped service. I shopped around and was offered a plan by NetSpace which was pretty much the same as Telstra's. I rang Telstra and asked them if they could do any better. The sales rep said: "Telstra does not play that game."! What kind of answer is that? I asked him why there was a cap on the business plan, and he had the audacity to tell me there was a "strong request from businesses to have a defined limit". Does Telstra think we are all idiots? He then told me that it makes sense to have a cap, and that if I was not happy, I was free to go elsewhere. I pointed out that my business has five mobile accounts and three landlines with Telstra, for which I pay around $10,000 per year. "Sir," he replied, "we have many companies that use this service that pay a lot more than you." I couldn't believe the nerve of this guy, so I asked to speak to his superior. He told me to hold — then cut me off!

To give him credit, he was probably just following Telstra's guidelines. I now know this is called Telstra's Standard Response (SR) Policy. Telstra has been in SR mode for a long time now. If this goes on, we will all keep getting backwards service. In the meantime, it is back to NetSpace for me; its reps must love having business handed to them on a platter.

Name withheld by request
Hobart, Tas

We are in control

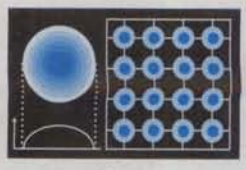
I'm a legitimate Microsoft Office owner and I don't like being made to feel as if I'm untrustworthy. It seems easy for Microsoft to make you phone in for a new registration confirmation code every time you install Office 2000, but will there be a limit on the installations we're allowed? Will they say "No" the third time, or the 23rd time? It's true that I'm buying a licence and not a product, but I don't like it. I feel

I can...

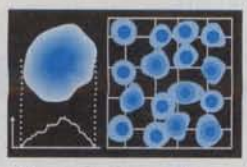


...print photos with zero discernable grain.

High precision dot control.



S800.



Lower-level technologies.

Smaller, better ink droplets.

A unique Canon process called MicroFine Droplet Technology™ uses 4 pico-litre ink drops. A special star shaped nozzle creates near perfectly round, centre weighted droplets for more accurate placement.

Star shaped nozzle.



2400 dpi, super low density ink.

The S800 uses a 1200 dpi nozzle with interleaved printing to achieve 2400 x 1200 dpi. Special low-density inks are approximately 1/6 the density of normal inks. These have an apparent dot size equal to 0.67pl of regular ink.

2400 dpi plus Microfine Droplet Technology

SuperPhoto mode, 49 tonal levels.

In SuperPhoto mode the S800 can print up to 42 ink droplets per pixel. This allows the printer to achieve 49 tonal levels with zero graininess, even in highlights or gradations where dots are normally distinguishable.

USB

Parallel and USB interface for Windows and Mac.[1]

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

3-YEAR WARRANTY OPTION

Extra large print heads with 6 separate ink tanks.

There are 256 print nozzles per colour on the print head. Separately replaceable, transparent ink tanks and a smart monitoring system help maximise operating economy.



Separate ink tanks.

S800

colour Bubble Jet™ printer

Just $649[RRP]

You can...

Canon

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CS0445/6

that Microsoft is treating me as a potential thief. So, despite owning a registered copy of Office 2000, I now have Sun's StarOffice installed. I certainly won't be upgrading to Office XP. StarOffice will take some getting used to, but I feel safer: I'm in control.

Gordon Woolf,
Hastings, Vic

CD fix

In response to James Simons (*APC* July, page 48), I was also disappointed when the new CD cases came in the mail. I am a very organised person and I could imagine my desk being covered in these new CD cases in the months to come. One day, however, I found a solution at work when I was sorting through some old junk. I came across an old 5.25in floppy disk case and thought: hey, I can use this for those new *APC* CDs. I took it home and tried it. The CDs fitted perfectly.

Phillip Suthers
Morayfield, Qld

Cybersnoopers

Having just had a visit from one of the latest viruses, I am left asking when the Internet will be a trustworthy place to conduct your life. Glorious plans to put everything online, including medical records and your home security system, present a poor balance between convenience and the potential for intrusion. Cybertrashing a house could be a real possibility, not to mention that insurance companies could snoop through your medical history.

The *Titanic* was a technological wonder that was fatally flawed. Will the Internet be the *Titanic* of this century? Anyone who has read *The Machine Stops* would have to wonder how closely fact will follow fiction.

Roger Pearson
Mount Gambier, SA

Big disappointment

I am very disappointed by the Quicken Deluxe application on *APC*'s June cover CD. You called this a "great personal finance program", yet the entire package has clearly been designed for small businesses. Getting anything out of this as a home finance package would require huge modifications. Had you advertised it as a "small business finance package", I would have no gripe, as I would not have purchased your magazine. Now I doubt that I ever will again.

Michael Wardle
Internet

Enter *The Matrix*

As an IT professional, I am baffled by the amount of time people spend on computers and in particular, the Internet. Sure, the Internet is great for catching up with friends, paying bills and shopping, but is this modern techno-addiction controlling our lives? More of our socialising is done on a computer screen, which involves little intelligence and almost no pleasure. Life may be all right for the moment, but the real test will come when computers emerge as the centre of our lives in the 21st century. However unrealistic the plot of *The Matrix* was, the reality might not be too far away.

Matt Campbell
Altona, Vic

More than meets the eye

Reading "Laphelds and luggables" (*APC* July, page 50), it struck me that some of these devices were actually very good ideas that just never took off. Why not? Well, it could have been the price, the portability, the size or even the weight. However, now is the time for the advancement of the PC. Notebooks are becoming more and more popular, but can they overtake the desktop? I think yes; but with one minor adjustment. Having both a desktop and a notebook, I use the desktop more often for work, browsing the Internet and playing games because I am more comfortable sitting in front of it for long hours. Like many notebook users, however, I love having a computer that I can take anywhere without much struggle. Now imagine combining the two. Wouldn't it be wonderful to have a notebook which could transform into a desktop computer in a few seconds? The minor adjustments that would be needed are quite simple. The LCD screen could be detached and placed in a holder similar to any desktop PC, and the mouse could be stored in the notebook carry-case. Designing it is just a matter of figuring out the best way to make the LCD detachable. Maybe the hardest part would be conjuring up a name. What about "notetop", "deskbook" or maybe even "transformer"?

Greg Solon
Hampton Park, Vic

Give us a chance

In today's workplace, IT companies do not seem to be willing to employ graduates without work experience, even if the job advertised is a graduate one. The question remains, who is going to fill all the job vacancies in the technology sector? People in the IT business should be more willing to take a risk. Are companies willing to keep advertising the same job until they find someone with experience? Or will they finally give those that have the knowledge but are new to the workforce a try?

Michael Leong
Melbourne, Vic

Give Microsoft the dual boot

According to Michael Smith (*APC* May, page 48), Microsoft's Jim Allchin has described open source software (OSS) as a "destroyer of intellectual property". The only things that OSS can destroy are monopolies. But now that we are stuck with a monolithic Microsoft, I would like to issue a two-part challenge to the open source community:

1. Replicate Windows
2. Replicate Office.

Gavin R Putland
Calamvale, Qld

Conditions of entry from page 96

These conditions apply to all competitions in *APC* September, unless specific conditions are provided with the competition. Instructions on "How to Enter" form part of the Conditions of Entry of all competitions in *APC* September. Entry is free and open to all residents of Australia other than employees of ACP Publishing Pty Ltd (ACN 053 273 546), suppliers of competition prizes, their families and associated agencies. The contests close last mail September 21. Enter according to the instructions supplied with the individual competitions. The judges' decision is final and no correspondence will be entered into. No responsibility is accepted for late, lost or misdirected entries. All entries become the property of ACP Publishing Pty Limited, the promoter, 54 Park Street, Sydney NSW 1028. The prizes are not transferable or redeemable for cash. Any change in the value of the prizes occurring between the publishing date and the date the prizes are claimed is not the responsibility of the promoter. Winners will be notified and their names will be published on **apcmag.com**.

Warranty conditions from page 96

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I can...



BJC-55.
Ultra small, ultra light, including Li-ion battery. Weighing only 900 grams, the BJC-55 is approximately ½ the size and weight of the BJC-85. Using the included battery and IrDA interface it is capable of cordless communications out of the box. An international AC power adaptor is also included.

BJC™-55
colour Bubble Jet™ printer
Just $649[RRP]

...fit in a briefcase.

BJC™-85
colour Bubble Jet™ printer
Just $429[RRP]

BJC-85.
Super powerful portable printer, international adaptor standard.
It fits easily into a briefcase, but offers desktop quality and flexibility. An international power adaptor is standard and a sheet feeder is built-in. IrDA 1.1 plus parallel and USB interfaces are standard.[2] A long-life NiMH battery kit is available as an option.[3]

Exceptional colour, optional PhotoRealism.
Using standard inks optimised for plain paper, both printers automatically print high quality images using Drop Modulation Technology™ with variable ink drop sizes. The optional PhotoRealism inks offer exceptional photographic printing.

High speed black and white.
A four colour print head with resolution up to 720 x 360 dpi comes as standard. Both printers accept an optional dedicated black ink cartridge with 128 print nozzles for print speeds up to 5 ppm.[4]

PORTABLE PRINTER CHECK LIST

IrDA for totally cordless operation.



High speed black.



Optional colour scanner cartridge for images, fax and OCR.[1]



Four-colour print head.









Drop Modulation Technology.

Both fit into a briefcase.



USB interface included with both models.[2]

USB

3-YEAR WARRANTY OPTION

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CS0667/4

Do we really want satellite navigation and handheld computers to take the mystery out of travel?

Technology and travel: the future of adventure



Gabrielle Kuiper

Gabrielle Kuiper rides her bike everywhere and works across the science/policy, human/environment, oral/written, advocate/academic, paper/electronic divides in the hope of contributing to positive social change. She can be contacted at Gabrielle.Kuiper@uts.edu.au.

There's no doubt that technology influences the way we see the world and how we travel through it. Recently, US millionaire Dennis Tito's perspective on the world was significantly altered when he became the first full-fee-paying "space tourist" and rocketed from Kazakhstan to the International Space Station and back to Earth in six days.

Tito is a former aerospace engineer who underwent rigorous training for the journey. Because of his wealth and enthusiasm, he was able to travel in a way usually reserved for elite scientists and the occasional monkey. He has seen the Earth from about 350km above the surface and he thinks it's a pretty cool view. He said, after the voyage, "It was perfect. It was paradise." It seems that money can buy a whole new attitude (or should that be altitude?) on the world.

Thanks to photographs, TV and, more recently, Net broadcasts, most of us are also familiar with the view of the Earth from space. Meanwhile, we use conventional technologies to travel — legs, bicycles, scooters, skateboards, cars, buses, trains and planes. Few of us are likely to travel in dramatically new ways in the near future. Jetson or Bladerunner-type vehicles are fantastic science fiction, but they don't look likely to take off any time soon.

Computers and satellites could change our view of familiar streets and foreign lands within a few years.

However, computers and satellites could change our view of familiar streets and foreign lands within a few years. Currently, we navigate through unfamiliar territory using the centuries-old technology of the paper map. Stand in the centre of Paris or Oslo or Osaka, and you'll see tourists with their heads buried in their maps and guidebooks, trying to orientate themselves in relation to the nearest castle, art gallery or Net café.

If things go Lonely Planet's way, these tourists will soon be operating GIS-based, satellite-linked palmtops to find the same places — with the advantage that the computer will always know where north is. Such devices will make getting lost almost impossible. Even if you wake up in a Milan gutter one morning next to an empty bottle of vodka, your handheld computer will be able to tell you the fastest route to the nearest train station and when the next train out of town is.

It sounds handy, but I wonder what will happen to serendipity, spontaneity and discovery? What is the future of adventure when every traveller has a palmtop GIS guide? If we look at the world around us through a computer, our view of it will be mediated even further by technology. Having a screen imposed on our eyeballs with retinal scanning (as has been proposed) would make such mediation close to complete.

Recently, on a plane to New Zealand, I sat next to a woman who pulled out her guidebook to show me the route she and her partner planned to take around the South Island. They intended to go jet boating and bungee jumping in Queenstown, walking on the Fox Glacier and whale-watching at Kaikoura — and had booked everything in advance over the Net. Every day of the trip was planned and booked online. I'm sure they had a wonderful time, but I wondered where the excitement and passion of such a precisely planned journey lay.

Having perfect knowledge of a place you are exploring is like sleepwalking. To have new experiences is to step into the unknown, to take the risk of going outside the familiar, the routine and the predictable; it is to live in the moment. These are often the most pleasurable times of our lives; when we step outside our domestic day-to-day soap operas and do the unexpected or risk the unpredictable. If new technology means never getting lost, I'll be leaving my palmtop at home.

I can...





LIDE technology allows a smaller, sleeker design.

Easy to use.
The ScanGear Toolbox lets you select functions and the final destination of your scan such as printer (copy), e-mail program, fax, or others,[1] and automatically makes settings for you.



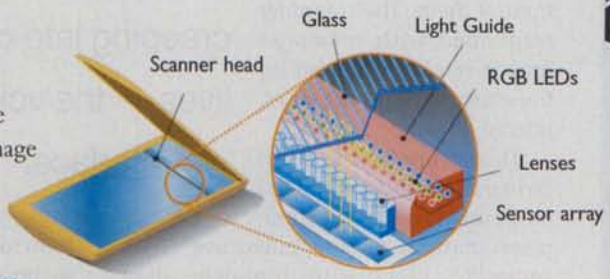
Getting started is easy.
Your scanner plugs directly into the parallel port, or hooks up as the middle link between a printer and your PC. CanoScan™ Setup installs the included software, and you're ready to make your first scan with Windows 95/98/Me/2000/NT 4.0.

Introducing LIDE.™
LIDE (LED Indirect Exposure) changes the way scanners work and their price/performance ratio by eliminating the need for costly, complex mirrors. Yet it maintains image quality and colour clarity in two super slim, sleek scanners. The CanoScan N340P (300 x 600 optical dpi) and CanoScan N640P (600 x 1200 optical dpi).

LIDE LED Indirect Exposure

...get a colour scanner for as low as $129.

Full software suite, 42-bit colour input.
The CanoCraft CS-P software works for both stand-alone image acquisition, and as a TWAIN driver for other applications. Advanced controls allow various pre-scan settings such as selecting the scan area and selecting up to 42-bit colour input. The software package also includes ArcSoft PhotoStudio 2000 for photo-editing and Caere OmniPage Pro for converting scanned documents into editable text data, plus a CD ROM with user's manuals.





CanoCraft makes high quality colour easy.

42 bit input

CanoScan™
N 640P
600 x 1200 dpi
Just $159[RRP]

CanoScan™
N 340P
300 x 600 dpi
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CS0667/5

Are you ready for the fifth generation of human–computer interfaces?

Talking to objects



Jeremy Horey

Jeremy Horey is a solution architect at Dimension Data iCommerce. He can be contacted at jhorey@ozemail.com.au.

The views expressed in this column are not necessarily those of his employer.

The most important part of a computer system is its interface with human beings. How do we interact with the computer? How do we get the computer to do things and how does it tell us when it has done them? When I started out as a computer programmer many years ago, we used punch cards to tell the computer what to do, and the computer gave back the results printed on paper. This was not a very efficient way of interacting — it could take a day to complete a simple interaction with the computer.

The next generation was a huge improvement. We moved from a paper-based interface to a visual display unit interface. Humans began to type things on keyboards that then appeared on the screen in front of them. The computer responded with messages that were also displayed on the screen or, in some cases, printed on paper.

This advance allowed us to do in a few minutes what had previously taken a day. Computers started to become "interactive". Then came PCs, along with third-generation interfaces. They ran programs like Multiplan, WordPerfect or Lotus 1-2-3. These took up the whole screen and typically had a menu along the top of the screen that listed the available commands. On the main part of the screen they displayed the text or data you were working on.

Most productivity programs still use third-generation interfaces. They try to cram as many functions as possible into the menu system and they have tool tips to help us learn what we can do with the program. However, we still have to know a lot about a program before we can use it properly.

The fourth generation of user interfaces came from the Internet and is based on the Web browser. Instead of trying to give us lots of functions, Web site designers tried to give us lots of information. For the first time, user interface designers had to develop interfaces that would work for people who had no training at all in the software. They added as much explanation about each interface item as they thought we would read, and they had to make the names and menus as meaningful as possible.

The functionality available in each application is limited compared with third-generation interface programs such as Word or Excel. But the interface is much richer with information in text (and sometimes multimedia) form. Most of us use third- and fourth-generation interfaces every day; they are accepted as the way to interact with computers.

A new type of interface is creeping into our lives — the voice interface.

However, a new type of interface is creeping into our lives — the voice interface. Before you laugh, let me explain that I don't mean PC voice interfaces. I'm talking about the voice interfaces we use over the telephone.

Voice interfaces used to be a bit of a joke, partly because it was quicker and easier to use a keyboard than to talk to your PC. It was also because we had social inhibitions about talking to objects. Voice recognition has come a long way, though. The latest versions of this technology recognise a wide range of commands in a variety of accents. Combined with natural language recognition, the new interfaces understand and respond to simple commands and questions.

Also, the social inhibitions are no longer there — we pick up a telephone to use these systems. We are now used to talking to voicemail systems, and it is more private than sitting in front of a PC.

Soon you will be dialling phone numbers or ordering pizza by using your phone to talk to a computer. At last, we'll have real mobile computing. When you don't have your hands free to note down a number, or when the pizza company operators are all busy, using these systems will make a lot of sense.

I can...



Push button simplicity, unconventionally silent.
A one touch scan button activates ScanGear Toolbox CS (the scanner control software). It lets you select functions and the final destination of your scan such as colour printout (copy), e-mail program, fax, or others.[2]

...scan up to 600 x 1200 dpi, with USB for Windows and Mac.

42 bit input

High powered scanning with LIDE.
Patented LIDE™ technology delivers optical resolution up to 600 x 1200 dpi with 42-bit colour input. ScanGear CS and universal TWAIN driver for other applications offer direct scanner control.

LIDE LED Indirect Exposure

Plug'n play USB for Windows and Mac.
The USB interface is compatible with Windows 98/Me/2000 and Mac OS 8.5 or higher.[1] And, because the scanner is powered directly through the USB cable, it does not need a separate AC cable.



"Z-lid", advanced OCR.
This special lid simplifies book scanning and OCR with the bundled Caere OmniPage Pro[2] converting scanned text into editable data.



Edit and store photos easily.
ArcSoft PhotoStudio 2000 is an easy to use image editor, and ArcSoft PhotoBase creates photo databases. Electronic manuals for Windows and Mac are included.



CanoScan™ N 650U

Just $199[RRP]

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CS0667/6



Kimberley Heitman

Kimberley Heitman is a Perth lawyer and the chairperson of Electronic Frontiers Australia. He can be contacted at kheitman@it.net.au.

To many Web hopefuls, portals seemed to be the ideal way to make money. But like most get-rich-quick schemes, there were a couple of minor snags.

Portals: the toll lane on the superhighway

Of all the dot com dreams, it's the portal that has suffered the most. A seemingly endless list of pretexts for aggregating online traffic were mooted, capital was raised, and then Web site operators burned money while counting page hits as revenue. Some sites are dead and buried, and others survive purely on the optimism of investors. Internet pundits guessed that consumers would flock to shop online and subscribe to online services; well, they guessed wrong. Some services have established B2C ("business to consumer") viability after a fortune spent on marketing, and others have found that success eluded them whatever they did.

Portals, in theory, mitigate risk in relation to online marketing in two ways: through revenue streams from advertising partners, and cross-marketing to email addresses left by the site's visitors. An apple-selling site, for example, could sell directory and marketing services to apple growers and sell banner advertising for other related sites. Other businesses would pay for lists of people who visit apple-themed Web sites, and try to sell related products and services to them. In theory, the portal owner had a business model similar to that for a shopping mall, and it was apparent that there were millions of potential customers out there.

It's not as simple as putting the site online and waiting for the money to roll in.

There are, but they want content, not advertising. Portal sites as venerable as Excite!, GeoCities and Buy.Com have found that direct advertising revenue from display advertising and sales of mailing lists is not enough to make a portal site viable. New sites which offer online directory services seem to be unable to overcome the problem that requiring payment for inclusion in a directory renders the directory incomplete. Thus whitepages.com.au (which lists everybody for free) is useful, while yellowpages .com.au (which charges for inclusion) is not.

This year, the Australian Securities Exchange (ASX) challenged puffery in portal launches by demanding further proof of concept from a company attempting to float a sex-related portal with one asset (the domain name sex.com.au) on the stock market. The company had proposed that since a lot of people were interested in sexual content, a portal site would aggregate traffic and be worth a fortune; perhaps as much as the famous www.sex.com site.

However, it's not as simple as putting the site online and waiting for the money to roll in. Traffic on the Internet is valuable, but only in large quantities — deliver a million hits per day and the advertisers might be interested. To achieve that sort of hit rate, the portal site has to advertise on search engines and through affiliated traffic deals. Sites such as Ynotmasters or Click2Net show how traffic is streamed and counted, and conversions to membership or purchase are rewarded down the chain. Basically, exit traffic through banners or consoles is sold in bulk, and premiums return to sites for the percentage of traffic that makes a purchase.

Go to a portal site and click on the main banner; it should lead to another window with a banner which in turn will lead to another. The real money is not in individual membership of a site but in directing traffic through a virtual shopping mall. Hence, advertising-based services such as "free" ISPs have failed as revenue from banner advertising dwindles: click-through rates are dropping and the percentage of visitors who sign up is shrinking. Successful portal sites focus on buying traffic and selling at a profit rather than unique content.

So, expect to see portals failing unless they find a balance between paying enormous sums for advertising and on-selling the traffic to other sites. Otherwise, they're referring people who won't pay to people who can't sell — and this is a market where people do the maths.

I can...



Push for film scanning





Scans 35 mm film in slides, and strips in positive and negative format.

Push for photo scanning



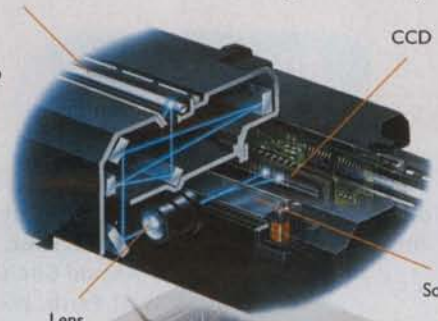
...scan trannies

with a built-in film adaptor, for just $299.

Easy to use, with USB.
The CanoScan™ D660U solves diverse scanning needs simply. No adapters or add-on kits. Everything is built-in, and is available with the push of a button. ScanGear Toolbox CS lets you select the final destination of your scan such as printer, e-mail program, fax, copy or others.[1] Or, direct driver control lets you adjust scan size, resolution, and other parameters. The USB interface connects to either Windows 98/Me/2000 or Mac OS systems.[2]



Superior 35 mm film scanning with VAROS.™
The scanner cover includes a built-in back light for film that reaches an extra large CCD sensor. Much like high-speed film, it has a relative light sensitivity up to 4 times greater than many 1200 dpi CCDs. It uses Canon's innovative two-pass VAROS scanning technology where the second pass is refracted by half a pixel. It activates automatically at resolutions greater than 600 dpi, capturing data that could be lost on a lesser scanner. The result is 1200 x 1200 optical dpi film scanning in less space and at lower cost.



VAROS

600 x 1200 dpi, 24-bit colour input.
Photo print and text scanning resolution goes up to 600 x 1200 optical dpi with 42-bit colour input capable of capturing more than 4 trillion colours. Data can even be software enhanced to 9600 dpi.[3]



Edit and store photos easily.
ArcSoft PhotoStudio 2000 provides tools for editing photos, and ArcSoft PhotoBase creates an electronic photo database. Also included are Caere OmniPage Pro for Optical Character Recognition,[4] plus Adobe Acrobat Reader and PDF manuals for Windows and Mac.

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42 bit input

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CS0445/10

Shopping online may be cheap and easy, but what if an etailer won't actually deliver? By ***Fiona Angus****.*

Online shopping hassles



Illustration by Tara Axford

Faster, cheaper, more choice with less hassle? The Christmas shopping rush hasn't even started, and Australia's online retailers have been unable to come up with the goods.

The Internet is meant to revolutionise the way we shop, but what can you really expect from online retailers? Several *APC* readers have discovered that it is easier for online retailers to hide behind firewalls and phones than to live up to their promises.

Dear *APC*,
I want everyone to know about E-Store's poor customer service. After I bought a computer security system from them, they sent me an email telling me it was unavailable. Initially, I thought I could solve the problem by sending an email. Boy, was I wrong. They never replied to any of my numerous messages. When I tried to ring the company's customer service hotline, a recorded message directed me to send an email! E-Store claims to be "Australia's largest online superstore" and has advertised aggressively in *APC* and elsewhere. It did not deliver my goods or answer any of my emails. Let this be a lesson to everyone.

Ahmad Ghani
West Perth, WA

A few days later, another unhappy E-Store customer contacted *APC* with a similar tale.

Dear *APC*,
I recently purchased an MP3 player from E-Store. After 10 days, it had not arrived, even though delivery to rural areas was supposed to take no more than six days. I called E-Store and was told to wait another day or two. I rang again two days later, only to hang up after being kept on hold for over an hour. I managed to get through after another two days, and waited while support personnel tried and failed to contact the supplier. That night, I received an email from E-Store informing me that my order had not been dispatched by the supplier. I sent a message requesting a refund. When this didn't work, I tried to ring, but was greeted with a recorded message informing me that the company's phone service was being upgraded and the only way to contact it was by email. It has now been three weeks and I have not received a player or a refund. How can E-Store get away with treating customers like this? It will get no more business from me.

Ann Miller
Rockhampton, Qld

What was going on? We tested E-Store's "customer service" hotline and were kept on hold for 30 minutes. When we called again the next day, a recorded message told us that the phone system was undergoing maintenance. This seemed to be the only phone number listed on E-Store's Web site, and it wasn't working. We started to worry.

The following day, we managed to reach a company representative. At first, he said he would be happy to look at Ahmad and Ann's letters. A week went by with no response. When we rang again, he assured us he was working on it and would let us know. After more waiting, we called and left a message, giving him the option to

I can...



High-speed Galileo Lens, 1200 x 2400 dpi. The easy-to-use unit delivers studio quality 1200 x 2400 dpi optical resolution for almost the same price as many 600 dpi scanners. The five-element, aspherical lens system eliminates distortion. A shortened optical path and wide aperture lens (f-stop=5.5) increase scanning speed and improve signal to noise for a more optically accurate system. A true 1200 dpi CCD sensor is capable of finer detail and more accurate colour.



Spherical aberration – Light converges at different points.

Galileo Lens – Light converges at a single point.

...scan film and prints up to 1200 x 2400 dpi with 48-bit colour.

High intensity film adaptor.
The optional film-scanning unit replaces the standard cover for reflective and film scanning, and matches or exceeds the performance of expensive moving light source designs. The light source in the cover uses dual sheets of 3M™ Brightness Enhancement Film plus dual, high-intensity cold cathode fluorescent lamps. It accepts colour negatives and positives in 35 mm, 2¼" and 5" x 4" sizes.

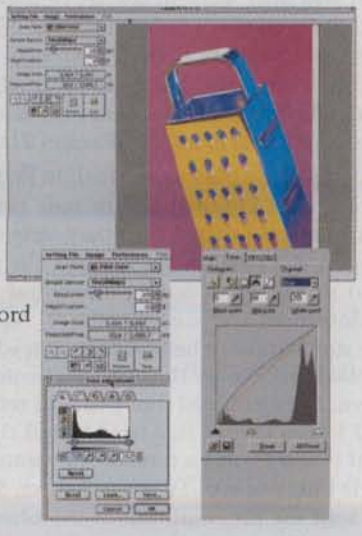


Optional FAU-S12 film adaptor, $199.[RRP]



ScanGear Toolbox CS offers "point and click" simplicity.

USB and complete software suite.
The USB interface connects to Windows 98/Me/2000 and Mac OS systems.[1] ScanGear control software, a universal Twain/Plug-in Driver, PhotoShop 5.0LE and ArcSoft PhotoBase are included for both platforms. ScanSoft OmniPage Pro 9.0 for Windows and OmniPage SE for Macintosh are also included for OCR. Canon PhotoRecord (Windows)/ ImageBrowser (Macintosh) helps users to easily copy, enlarge and print photos.



Advanced manual controls.

CanoScan™
D1230U
Just $449[RRP]

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3-YEAR WARRANTY OPTION

48
bit input/ colour

48-bit colour input.
True 48-bit input and 42-bit output increases subtle tonal variation and colour accuracy.

You can...

Canon

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Your Letters



Do you find shopping online a frustrating ordeal, or the perfect way to escape the soulless suburban mall? For at least one *APC* reader, shopping on the Internet turned out to be better than the "real" thing.

Dear *APC*,

I have read about bad experiences with computer shops and thought I would share an encounter I had with one online retailer. I wanted to buy a D-Link DI-701 firewall, and followed the D-Link Web site to its three main suppliers in Australia. Two were big-name retailers, but the cheapest was a NSW online retailer called EFD Systems. I filled out an online order form with EFD on Sunday and phoned on Monday to ask when I could expect delivery. The man on the phone was very helpful, and said that delivery would take approximately two days. He then asked me what kind of problems I was having on the Internet, and after talking to him for 20 minutes, I went away thinking this was definitely the place to shop. Thursday brought no sign of the item and I started to worry, but on Friday a van delivered my parcel.

When I opened it, there was a short letter enclosed which said: "As you can see, you have received the DI-804 rather than the 701. This is a newer product with slightly better firewall capacity and is ready to connect to both Telstra and Optus cable. Congratulations, you have just got this product for the lowest price in Australia! Tell your friends about EFD."

He had given me a superior and more expensive product for the same price! Now *this* is a company that I am prepared to recommend to anyone with a cable/ADSL service who wants a cheap home hardware firewall.

Peter Canavan
Paralowie, SA

Write to service@acptech.net or Service & Reliability, APC, PO Box 4088, Sydney NSW 1028. Letters may be edited for length or clarity.

respond. As no-one from E-Store returned our call, we can't tell you why Ahmad and Ann had such problems, or why E-Store's advertised range of up to 120,000 items is only 119,998 items.

APC hopes this isn't really an example of a "world-class online shopping facility", as E-Store claims. "Our mission," E-Store tells customers, "is to provide a wide choice amongst high-quality brands at a significantly lower price in a convenient, secure shopping environment open 24 hours a day." Sure, E-Store's prices may be competitive and there's plenty of choice, but what's the point if it can't actually deliver?

Ann and Ahmad's online shopping hassles didn't end there. Ann had to wait several weeks before she received a refund. She said E-Store had deposited an extra $10 to her account "for all the trouble", but it was too late. The MP3 player was supposed to be a present for her son, who was going into hospital. E-Store staff had assured Ann they could deliver the present long before he was due to come out of surgery. In the end, he spent his hours in the recovery ward with a borrowed CD player. "They don't deserve to have customers," Ann said.

Meanwhile, Ahmad tried to complain to management. Even then, it was several weeks before his refund came through.

However, it doesn't have to be this way. Another online retailer tried desperately to make amends to one *APC* reader for providing an aggravating Internet shopping experience.

Dear *APC*,

I shop at Sanity music stores all the time, so it was only natural for me to register with its Web site. I ordered a DVD of my favourite band, but when I put it in my DVD player, it wouldn't work. I tried the disc in different DVD drives and discovered that it was actually a Region 2 DVD, which will not play on Australian Region 4 players. I emailed Sanity four times, but the staff insisted that they only sold Region 4. I exchanged the disc (in person) at my local Sanity store, but the replacement was also Region 2. Again, the staff wouldn't believe me, even when I asked them to *try* the disc in a Region 4 drive. They just said that I should return it if I didn't want it. I tried to tell them that I didn't want a refund — I wanted a DVD that worked! Two weeks later, Sanity sent me an email out of the blue: "I have spoken with the record company and they have advised me that the information on our site is incorrect and the DVD is actually Region 2." I find it frustrating that my emails were not treated seriously. Email is a great way to communicate because it allows you to think about your response beforehand (and I hate being kept waiting on the phone). However, if Sanity cannot use current technology to respond to customer requests, then the Internet has a long way to go before it will be acceptable to keen shoppers like myself.

Matthew Bryde
Eagleby, Qld

Dodgy DVDs and unhelpful staff? Matthew complained to management, who quickly tried to mend matters. We asked Sanity what went wrong.

Dear APC,

We acknowledge that we did initially have an issue with the DVD in question and that there was some confusion relayed from our customer service emails. We acted immediately by contacting the supplier, who at first relayed the incorrect information. Upon Mr Bryde's second email, we contacted the supplier once again, and unfortunately they took four days to respond. They advised us that the DVD was in fact not the region they initially thought. Obviously, this fuelled Mr Bryde's frustration, and the situation was immediately brought to management's attention. We do acknowledge that there was some confusion from our customer service team in the follow-up emails, however the problem was immediately acknowledged and Mr Bryde was contacted, apologised to and compensated for this inconvenience. We have taken steps to ensure that a situation like this does not occur again.

Tania Wilson
Sanity content director

Sanity also gave Matthew a $40 gift voucher to sweeten the apology.

Tania said that Sanity has removed the rogue Region 2 DVDs from its Web site, but Matthew says he will hang on to his unplayable Region 2 DVD for now. The culprit was record distributor EMI, which doesn't make Matthew's DVD in Region 4 format. Despite the communication breakdown, Tania said Sanity usually answered customer emails within 24 hours, and that the Internet is much more popular with customers than the phone. "Occasionally something like this comes out of left field, but not very often," she said. Matthew remains unconvinced: "I'll continue to patronise Sanity outlets, but I certainly won't shop at Sanity online again."

Tell us about your online shopping hassles. Is the Internet really a better place to shop, or is online ordering just an easy way to avoid the customer?

I can...





Automated image improvement.
Another Canon technology makes the scanning process more accurate. FARE detects and removes the effects of dust and scratches on film.

...get virtually drum scanner quality, for an unbelievable price.

Ultra high performance colour scanning for the desktop.
The new CanoScan D2400UF delivers quality approaching that of scanners costing nearly ten times the price, which means professional quality scanning is now within the reach of the small professional studio.



High intensity film adaptor, built-in.
The scanning cover is used for both reflective prints and film. It matches or exceeds the performance of expensive moving light source designs, and accepts colour negatives and positives in 35 mm, 2¼" and 5" x 4" sizes.



Built-in film adaptor.



The six-element, wide aperture lens system eliminates distortion, increases scanning speed and improves signal to noise while delivering 2400 x 4800 optical dpi and 48-bit colour input/output. At the same time, the six-line hyper CCD also delivers an Optical Density of 3.3, a standard by which desktop drum scanners are judged.

USB

USB and complete software suite.
A USB interface for Windows 98/Me/2000 and Mac OS systems,[1] Twain/Plug-in Driver, PhotoShop 5.0LE, ArcSoft PhotoBase, OCR software and photo management software for both platforms are also included.

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You can...
Canon

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What's the difference between advice and advert?

Many salespeople don't seem to know.

Handheld digital devices

Buying a handheld digital companion, personal digital assistant, connected organiser, or whatever you want to call it, is becoming a popular occupation. Recent surveys indicate that the handheld market is expanding at around 15% per month, and it is predicted that up to 9 million units will be sold this year. Sadly, judging by our preliminary survey of several major stockists, you are unlikely to get sound, unbiased advice from many high street outlets.

Our opener for this month's price check was to ask for details on organisers that could talk to a desktop, and for recommendations. We emphasised price effectiveness and hinted that we were changing from a simple paper-based system. We left the salesperson to ask the relevant questions and decide what would be best for us. This approach proved almost universally pointless, as only one outlet (Calculator and Organiser King in Melbourne) had the sense to ask what we would be using it for, and which platform we were using. All the other outlets merely suggested a list of possible models, using brand names rather than operating requirements to decide which they thought was the most appropriate.

Most outlets proffered advice about memory size, indicating that more was always best, without qualifying that this has to be measured against the memory requirements of the different operating systems. An 8M Palm is approximately as effective, in terms of data and application storage, as a 32M CE device, but nobody pointed this out. Several retailers, including Dick Smith Powerhouse, Calculator & Organiser King, Harris and Ecom indicated that Windows CE units all cost a minimum of $1,000, despite Hewlett-Packard's current Jornada offer of just under $800. Many suggested the Palm m105 was a much better unit than the 100, simply due to its bigger memory, despite our stated basic requirements.

None of the retailers asked what kind of computer we had (Mac or IBM), or what kind of connector (USB or serial) was fitted on the desktop. Both of these are vitally important when choosing a handheld, and although USB doesn't give much speed advantage, it is the port of choice for today's (and, more importantly, tomorrow's) computers, so future compatibility is an important issue. Harvey Norman (the only shop to do so) was keen to point out the advantage of having MP3 capability as well as organiser functions on CE



devices. Calculator King noted that the HandSpring had better expansion than other Palm OS devices, but was fairly dismissive of Windows CE devices, perhaps due to our stated requirements.

Many retailers were distinctly hazy about the software package buyers could expect; only the Telstra Shop indicated that Excel and Word files could be used on most CE devices but not directly on Palm units. Most commented that the handhelds came with a cradle, but neglected to describe what it did. OfficeWorks was the best in this area, explaining that some Palm batteries charge while they sit in the cradle. In terms of speeds and feeds, including information on all-important battery life, OfficeWorks again took the laurels: the assistant swapped to a mobile phone and walked to the display to check actual working details, with a high degree of accuracy.

Most retailers tended to lean either towards Palm or Windows CE devices, without much consideration of our proposed usage, although OfficeWorks suggested a Casio PV450. Also, Dick Smith Powerhouse and Harvey Norman noted that the Ebookman was a viable alternative at a good price, but again, both gave only sketchy details. Dick Smith helpfully noted that the Palm provided far better options for downloadable applications than the Ebookman, but neglected to mention the availability of Windows CE applications.

Given the highly specific nature of the product, the level of feedback we received was, frankly, disappointing. Most retailers focused purely on products and prices, showing fairly sketchy product knowledge and a lack of interest in the buyer's requirements — so it's important to do your homework in advance and know what you want before you call. That said, you can certainly get a bargain if you know what you're looking for — you can save yourself over $60, or nearly 17% of the total cost, on an entry-level unit like the Palm m100, and the saving can be as much as $300 for the Jornada.

Company	Contact details	Palm m100	HP Jornada	Compaq iPaq
Dick Smith Powerhouse	(03) 9793 9677	$328	$1,200 approx	N/A
Harvey Norman	(08) 8342 8700	$349	$899	$1,100
Harris Technology	1300 139 999	$316	$1,100	$1,100
WC Penfold	(02) 6247 8515	$359	N/A	N/A
Calc & Organiser King	(03) 9696 3366	$299	N/A	$1,200 approx
Ecom	1300 369 838	N/A	N/A	$999
Telstra Shop	13 18 00	$298	$869	$1,239
OfficeWorks	(07) 5532 0522	$348	$779	N/A

About Price Watch

Each month, Price Watch examines variations in retail pricing and service. Investigations are conducted anonymously, either by telephone contact with retailers or through pricing details supplied on the companies' Web sites.

Prices and specifications provided here are as quoted by retailers; while we assume these are correct, we cannot accept responsibility for errors or omissions.

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In offices where space conservation is a concern, and strikingly rich colour is essential, the ViewSonic's Viewpanel Series is the perfect solution.

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Characteristics	350:1 Contrast Kensington Micro-Saver Security	OptiSync 350:1 Contrast Synchronisation to either analogue or digital video signals	OptiSync MVA Technology 3XLCD Display Synchronisation to any analogue or digital computer signal Panel Integrated Stereo Speakers	Only 1.3" Thin Bezel Integrated Speakers

Specifications	VG175	VG181	VP181
Viewable Area	17.4"	18.1"	18.1"
Characteristics	160° Viewing Angle 400:1 Contrast Dual Analogue Inputs	OptiSync 160° Viewing Angle Pivot	OptiSync & Video Inputs Dual USB Hubbs, Pivot

Specifications	VG150c	VE170
Viewable Area	15"	17"
Characteristics	Available in metallic silver 350:1 Contrast	1280x1024 true resolution 3.9" panel profile OnView® Controls including ViewMatch®



ViewSonic®
See the difference.

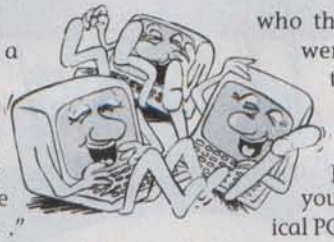
3 YEAR Warranty

ViewSonic Australia, Level 4 Suite 403 Miller Street North Sydney NSW 2060 • Tel (02) 9929 3955, Fax (02) 9929 8393, Internet: www.viewsonic.com.au • **IT&e Limited (originally Chips and Bits)** 1300 134 033 • **Ingram Micro** Tel: 1300 653 333, Fax: 02 9741 2001 • **Synnex Australia Pty Ltd** 1300 651 665

PC humour dates faster than chip speed.

It came from the far side

A businessman and a priest gaze at each other across a romantic candlelit dinner table. The businessman holds his wine glass up to his companion, and says: "Well, here's to computer dating. Let's hope they iron out the bugs soon . . ." Welcome to PC humour at its finest. Are you laughing yet?



During the '80s, *APC* found endless comic value in the PC. Readers couldn't get enough of cartoons portraying PCs in what were then far-fetched and incongruous settings. The black-and-white line drawings saved *APC* colour printing costs and helped improve the look of the magazine. Even a rudimentary sketch looked better than anything the green monochrome monitors of the day could yield for screenshots.

The cartoons were also fantastic space fillers, and were scattered liberally throughout seminumerical and nonrecursive algorithms, as well as articles about hardwiring "bell" tones into a PC. A keen *APC* reader might be halfway through a list of ASCII-hexadecimal programming characters and suddenly burst out laughing. Some cartoons were apparently so hilarious that we reprinted them twice in one issue.

Some readers were so inspired by the wit and sophistication of PC humour, they posted us their own drawings. One reader tried to lighten up a seven-page exposition on threaded interpretative language compilers (see right). The punchline? "Run testing the entire system".

Soon, advertisers wanted in on the joke. Cartoonists were suddenly flooded with commissions from PC companies who thought tiny caricatures were a great way to sell their latest products. "Have you ever had the feeling your computer is laughing at you?" asked these hysterical PCs in August 1982 (see left). According to the advertisement, the best way to conquer a smug PC was the fun-killing *Australian Business Computer* magazine.

Other jokes threatened *APC*'s good taste and family values. One advertisement from PJ Prentice and Associates screamed "Sex education!" in bold letters across the top of the page. Underneath, the small print reneged on the promise: "No — better still, computer education". The "long-established computer consultants" (now officially deregistered) were trying to attract enrolments for a three-week "computer familiarisation" course called "Which computer do I buy?".



October 1985

So when did PC users lose their sense of humour? *APC* certainly didn't slip any comic surprises into articles about the latest drivers for Windows 95. By then, the serious parts of the magazine were more amusing than the funny bits. Alas, recycling cartoons based on Basic and DOS commands (huh?) was no longer possible — they had become as obsolete as the technology. The PC was just another piece of furniture, or worse, had begun to mimic the very scenarios once held up to ridicule.

Fiona Angus

First issue May 1980



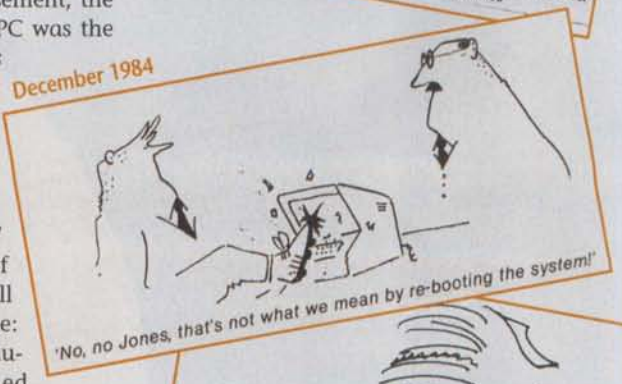
▲ The drawing on the left looks a lot like a take-off of Sony's robot dog (right), but it's really a prediction of how technology is about to "revolutionise the world of aids for the disabled".

March 1989

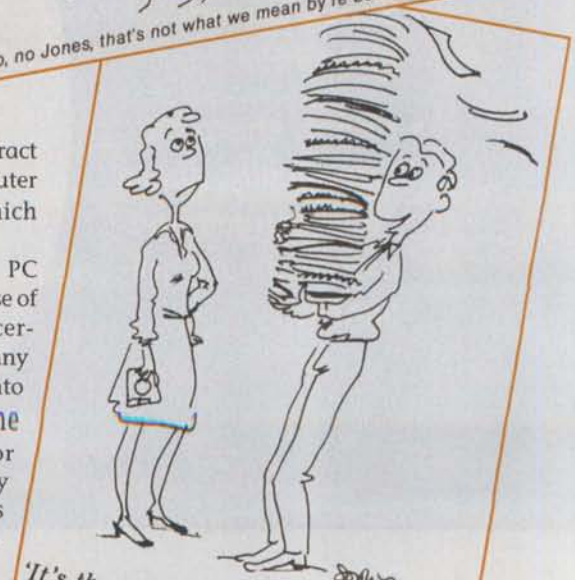


"Come on Briggs. You should know as well as I do that nose-scanning is one of our best defences against any unauthorised access to personal files"

December 1984



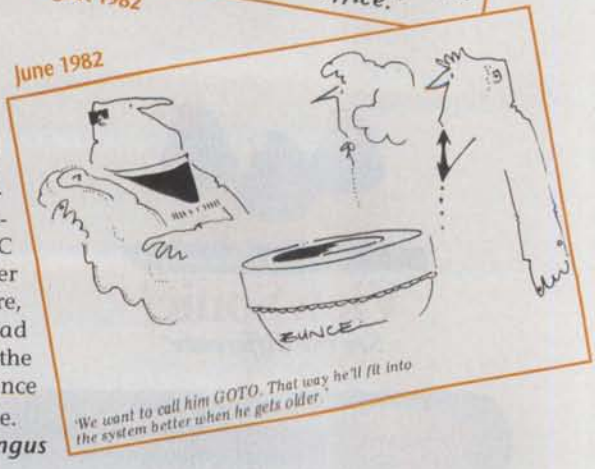
'No, no Jones, that's not what we mean by re-booting the system!'



'It's the first batch of documentation for our new 'paper-free' office.'

August 1982

June 1982



'We want to call him GOTO. That way he'll fit into the system better when he gets older.'

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Failing to prepare for power problems is preparing to fail

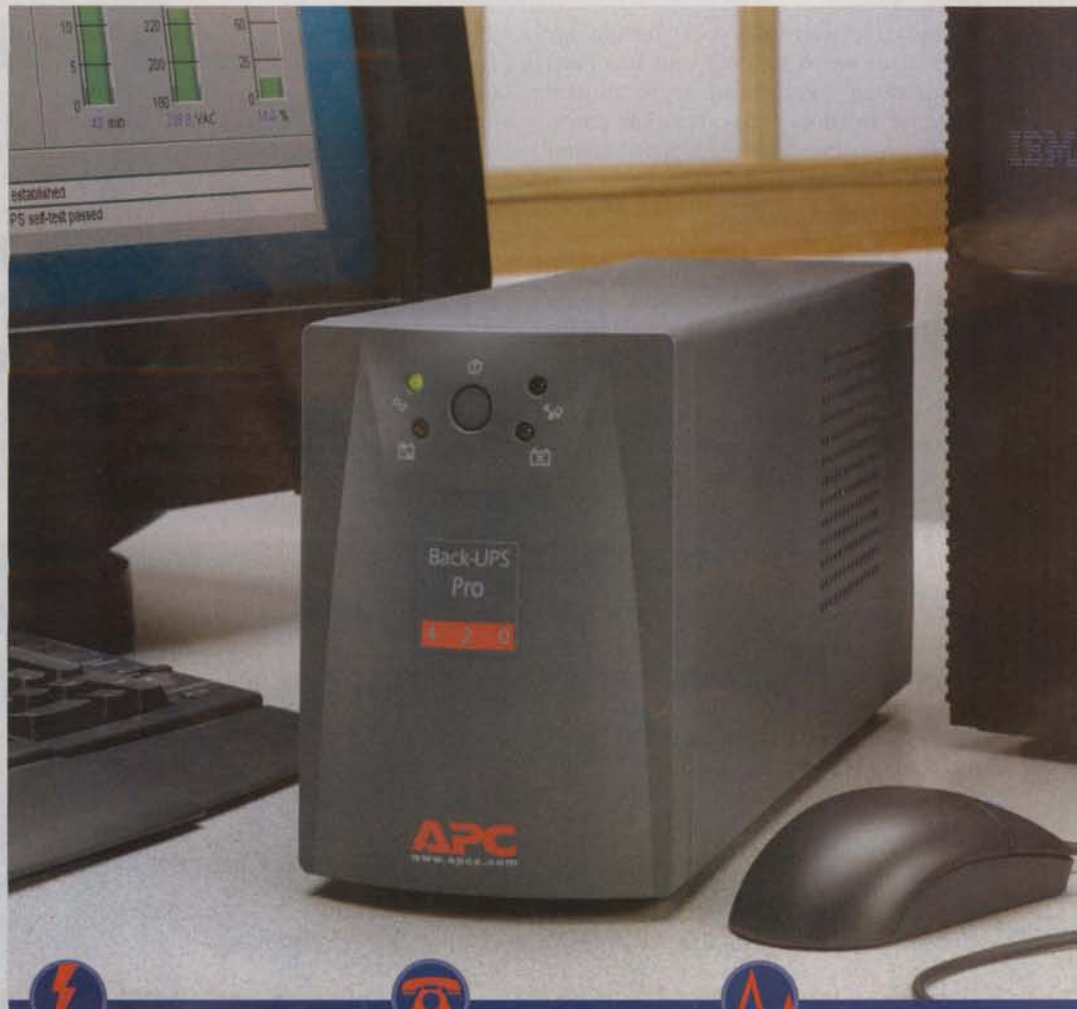
Protect your workstation against 4 daily power problems with APC's Back-UPS Pro

It's a fact. A study by IBM proved that your workstation is subject to 128 power disturbances per month, that's roughly 4 per day! Power problems are also the largest, single cause of data loss, accounting for 45.3% of all problems. The best way to protect your valuable PC, data and peripherals from damaging surges, sags and blackouts is with the award-winning Back-UPS Pro from APC.

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APC recommended worldwide

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3 battery back-up outlets protect your workstation from data loss and your monitor and one peripheral from destruction

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www.apc.com/au

Cutting Edge takes a look at the innovative organic molecules that will soon be inside your screens.

A healthy glow

Liquid crystal display (LCD) technology was invented in 1963 and has been used in everything from digital watches to mobile phones ever since. There's also the highly advanced colour form that's been used in the screens on notebooks and laptops for over a decade.

LCD technology was expected to revolutionise the television industry — it was predicted that every household would have a sleek, flat display hanging on the wall instead of a boxy CRT television sitting in the corner. This never became a reality, even with the advent of colour LCD technology. There are some major limitations to colour LCDs that have held the technology back. To understand those limitations, you need to have a good grasp of how LCD technology works.

In a liquid crystal screen, each display pixel is turned on or off by the electronic substrate behind it. Put simply, LCD screens work by filtering light pixel by pixel. In monochrome LCDs, such as that on your mobile phone, turning a pixel on blocks light (which makes the pixel black), and switching it off allows light through, providing clear, illuminated areas. This is the simplest form of LCD technology, and can be seen easily in daylight. However, when you put colour into the mix, as in the screens used on laptops, the technology gets far more complicated.

White light is produced when all the colours of light are combined. White light can therefore be split into different colours by using filters. This is how a rainbow is produced; it is the result of white light being filtered by the atmospheric conditions. Like CRT television screens, colour LCD panels create images by combining red, blue and green. Today's LCD screens can create 256 shades of the three primary colours, and when used in different combinations, the result is a staggering 16 million colours.

There are two different types of LCD screens: passive and active. When displaying an image, a passive display's arrangement of on and off pixels can linger momentarily before changing, even while the screen is refreshing with new images. This leads to ghosting, which is especially noticeable when a moving element appears on a static background. The effect is similar to the afterimage that stays on your retina when you look at a light bulb and then look away. Active displays, usually TFT (thin-film transistor) screens, have a transistor behind every pixel that controls the redraw and refresh rate, clearing the display faster than a passive screen.

Unfortunately, colour LCDs are not very bright, so all laptops available today use backlighting. This is like having a light shining behind the screen to make the displayed image more visible. Without it, the LCD images would be dull and flat.



▲ A 2.4in OLED prototype demonstrates an exceptionally even echinoderm.

However, the backlighting means that the notebook's battery runs out more quickly.

LCDs are also prohibitively expensive to manufacture. They are responsible for nearly a third of the price of any laptop, and as a result, keep prices high. Resolutions have improved over the past decade, but the cost-effectiveness of manufacture hasn't.

Better than LCD

The answer to all of these problems could be found in a very unusual material. Organic light-emitting diodes (OLEDs) were first discovered in 1979 by a chemist working at Eastman Kodak, who found that a molecule he was studying gave off a bright blue glow when an electrical charge was run through it. Thus began an investigation into OLEDs that has accelerated over the last few years.

Two types of organic electroluminescent displays are being researched: molecular OLEDs, which are being studied by Eastman Kodak and organic light-emitting polymers (OLEPs), developed by Cambridge Display Technology. Molecular OLEDs are the smaller of the two, which means that they make slightly thinner displays. On the other hand, the greater size of polymer OLEPs makes them easier to manufacture. In any case, these two technologies have similar properties and work on a principle that is surprisingly elegant, compared with the complexity of LCD screens.

OLEDs and OLEPs are much brighter than liquid crystal, and can be seen clearly in daylight. As a result, the screens don't require backlighting and consume far less power. Each pixel also requires less electricity to fire up, and can be turned off much faster than in active matrix LCDs, which also reduces power consumption.

Because of their relative simplicity, organic electroluminescent screens are much cheaper to manufacture than LCDs. The main display consists only of OLEDs or OLEPs trapped between a metal cathode and a glass substrate. Both OLED and OLEP displays have been released in the past year, in both passive matrix and active matrix forms, but not at notebook screen sizes.

The current screens are small, but they're perfect for mobile phones and digital cameras. Motorola, Kodak and Seiko Epson have already begun using the screens in their products, and many more manufacturers will release organic electroluminescent products in the coming year. Tantalisingly, the small displays used in early OLED mobiles have everything required to show video or DVD.

Properly harnessed , organic electroluminescent displays are everything that LCD technology isn't: light, bright and easy to manufacture.

Darren Ellis

LCD1530V



LCD1525M – white



LCD2010X



LCD1525M – black





LCD1810X – black



LCD1810X – white



LCD1525X



LCD1510+

Multiple Choice

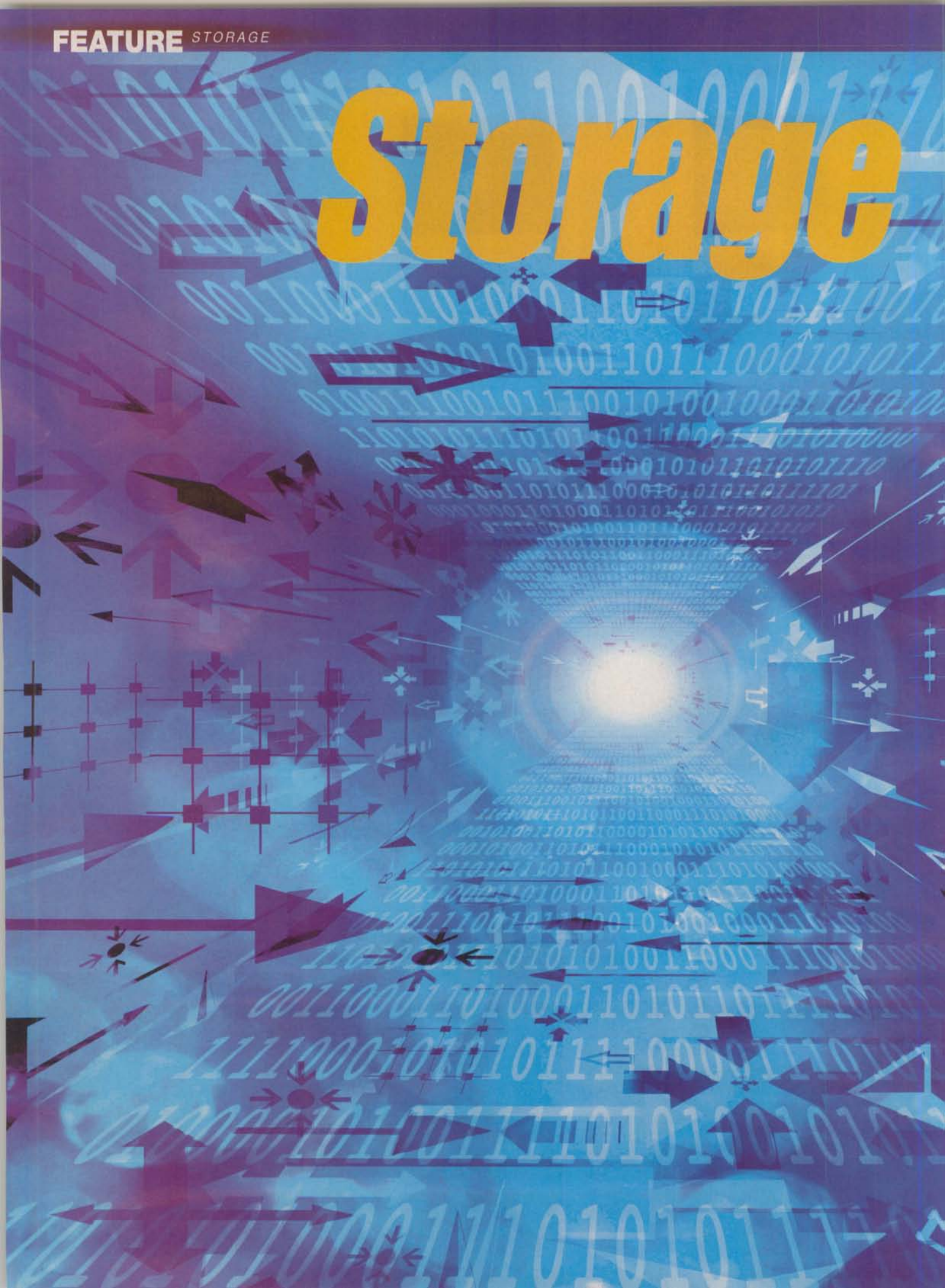
No one offers you a range of LCD Monitors quite like NEC. For users who need superior image quality in a small space, the NEC MultiSync LCD monitors deliver bright, sharp screen performance in a slim, lightweight package. Select from 15", 18" and 20" models with a choice of options including multimedia, USB, adjustable height, analog and digital (DVI) connectivity and the versatility of portrait/landscape capabilities. All monitors have detachable bases to enable either wall or arm mounting. With 60% less depth and 70% less weight than a CRT monitor desk space is substantially reduced. With so many models and options to choose from, NEC provides revolutionary flexibility to meet the needs of every user.

NEC

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Storage



Superguide

Whether you use a PC at home, a computer at work or back up data, storage space is one thing you can always use more of. ***Darren Ellis*** *evaluates devices for file sharing, general storage and expanding your current storage base.*

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Internal hard drive storage	83
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The Internet age has opened up more and more opportunities for software and file distribution. You can archive all of your CDs onto your hard drive to turn your PC into a jukebox. Computer games come on multiple CDs and digital video gobbles up hard drive space. Even though today's hard disks are many times larger than they were 10 years ago, they never seem to be large enough.

Video and music compression have been responsible for files that are smaller and more accessible than ever before, but they have also brought a shift in thinking. The compression techniques are better, but the actual video file sizes have increased. A slight increase in size means leaps and bounds forward in audio and video quality. Broadband access allows you to download near-video quality music videos ripped from MTV, and even television episodes or entire movies. The development of Napster and other file sharing programs has meant that people can and do hoard entire CD collections on their drives.

Full installation of computer games can take upwards of 1G, and applications top out at around 700M. Install a few of these and the 10G hard drive that came with your system can get a little strained, especially when the operating system and office packages take up so much real estate.

Even the humble floppy drive has seen a sharp decline in use in the past few years, and manufacturers are beginning to phase it out of new systems in favour of smaller flash memory media that hold many times more data. In this age of enhanced software, a meagre 1.4M floppy just isn't good enough for transferring files from PC to PC. If you do use floppies, you might become annoyed with the time it takes to read and copy from them.

Of course, it's not just about personal storage. Corporations looking to back up files, transfer gigabytes of data between PCs or have a centralised storage area are finding current resources strained. Fortunately, there are smaller, faster devices on the market that have more storage space than you could poke a stick at.

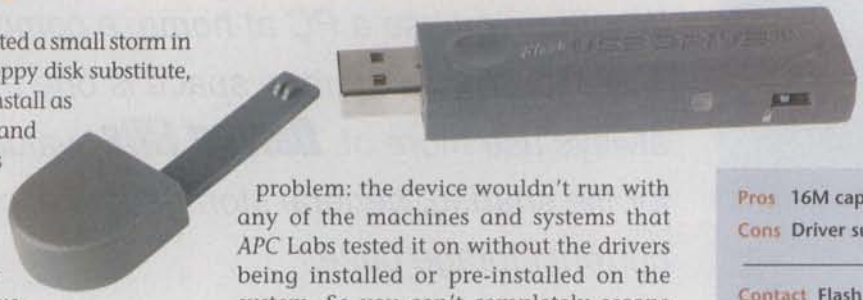
APC Labs has taken a look at a wide range of storage for this feature, from small key ring storage devices to hard drives and network-attached storage. Covering over 30 products in five categories, *APC* Labs has evaluated which options are best for your needs based on price, performance, capacity, ease of use, warranty and reliability.

Pocket storage

As mentioned previously, the floppy drive has had its day, and pocket storage devices are making their way to the fore. *APC* has categorised these devices as pocket storage based on two important considerations which separate them from the other categories. First, they are small units that can fit easily into a pocket, and second, they require no extra drives or readers, as the portable drives in the next category do.

Pocket devices run directly from either the USB port or the PC Card slot; they do not require special drives or caddies. The units reviewed range from USB key rings with flash memory to PC Card devices incorporating small inbuilt hard drives, and all of them can be excellent replacements for floppy disks. These plug-and-play single units have a minimum storage capacity of 8M and run right up to 1G.

Flash USBDrive



The Flash USBDrive created a small storm in *APC* Labs. It's a great floppy disk substitute, and when you need to install as many drivers, patches and updates as *ACP* Labs does, or even just copy documents and files from PC to PC, you soon find that a 1.44M floppy disk doesn't cut the mustard. However, a 16M USB device does.

At twice the capacity of the IBM Memory Key, the Flash USB would be ideal for widespread use if it were not for one problem: the device wouldn't run with any of the machines and systems that *APC* Labs tested it on without the drivers being installed or pre-installed on the system. So you can't completely escape the floppy with this alternative.

Once you've installed the drivers, the USBDrive works like a dream. The tested unit had a 16M capacity, but if you really need it, Flash USB Australia sells units with up to 512M, and there should be a 1G unit coming soon.

Pros 16M capacity
Cons Driver support could be better

Contact Flash USB Australia
Phone (02) 9281 2688
Online www.flashusb.com.au
Price $119

IBM Memory Key



The IBM Memory Key is one of the latest solid state USB devices on the market, and was first reviewed in *APC* April, page 42. The unit still comes in only one capacity: 8M. This isn't the highest capacity available for solid state USB devices — the ThumbDrive and the Flash USB both come in 512M — but it is enough to help you get by without a floppy disk.

The Memory Key has native Windows 2000 and Windows Me support, but needs drivers (40K) to be installed on any system running Windows 98. The unit comes with a key ring, which makes the Memory Key essential equipment for the IT person — it's the floppy for your pocket.

The main drawback, apart from the restrictive 8M capacity, is that it is expensive; the IBM name attracts a premium. It's a handy unit, but the 16M Flash USBDrive has double the capacity for only $20 extra.

Pros Extremely handy device
Good driver support
Cons Comparatively low capacity Expensive

Contact IBM
Phone 1800 289 426
Online www.ibm.com.au
Price $99

Trek ThumbDrive



The third USB memory device is the Trek ThumbDrive — a past favourite of *APC* (November 2000, page 38). *APC* tested a 32M unit, which is a higher capacity than the other two USB devices we looked at. The 32M device is the smallest of the three units, but is slightly thicker than the other two. This resulted in some problems fitting the USB stick into the slot if there was another device plugged into the adjoining slot. However, with a bit of jiggling it can fit.

The unit is supported by all versions of Windows and Mac OS, but not natively on all versions. As well as the 32M versions, units from 16M up to 512M are available in the same size package (expect to pay around $3,200 for the 512M version).

The ThumbDrive is similar to the Flash USBDrive in that it has a lock to protect data. If it had better drive support, this would have been one of the higher ranking USB memory devices.

Pros Good capacity
Cons Doesn't fit easily into the USB slot

Contact OzEntrepreneur
Phone (02) 9360 3465
Online www.ozentrepreneur.com.au
Price $215



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Iomega PocketZip



PocketZip (formerly known as Clik) disks are excellent storage devices that fell flat when first released. They have everything you could want in this type of storage medium: they are incredibly small (about the same size as a Microdrive but as thin as a five cent piece), store 40M of data, and are very cheap at $50 for a twin pack.

The PocketZip medium took off with the release of the HipZip MP3 player, which offered greater storage for far less expense than other market-leading players. Iomega has recently released the PocketZip PC Card drive (see *APC* July 2001, page 44), which allows the disks to be used in laptops and portables. PocketZip disks are a great way to save documents and files, and are no longer limited to use with the HipZip and PC Card drive, as there is now a USB reader (not reviewed) available, which allows them to be used in a PC. The PC Card drive comes in a stylish, rubber-padded clamshell holder that has room to fit a few PocketZip disks in with the drive.

Pros Small and durable storage
Low cost per megabyte
Cons No Mac support

Contact Iomega
Phone 1800 466 342
Online www.iomega.com/anz
Price PocketZip PC Card (with 40M PocketZip disk) $249
PocketZip disk 2-pack $50
PocketZip disk 10-pack $229

Iomega Microdrive

This is the smallest hard disk in the world. The Microdrive (developed by IBM) is slightly larger than a postage stamp, is thin enough to slot into the CompactFlash slots on most devices, and has an unbelievable storage capacity for its size. At the moment, the Microdrive comes in two capacities that have been reviewed previously by *APC*: 340M (June 2000, page 46) and 1G (June 2001, page 48).

Iomega is selling the IBM drives under the Iomega banner, but aside from the logos and packaging it is the same deal — a Microdrive with a PC Card adaptor. There's a pricing premium added to the Iomega Microdrives, so expect to pay a little more. However, this does include the excellent Iomega Quick Sync 2 software, which offers one-click backup, data protection and tools.

As they work with most CompactFlash devices, Microdrives can be used to expand storage on other devices such as digital cameras to hundreds of times their original capacity. As a backup or general storage medium, the drives are very fast, quiet and reliable. The Microdrive is an elegant storage solution with many possible uses.



Pros Adaptable to many uses
Excellent capacity for its price
Cons IBM sells the same drives (without the software) for less

Contact Iomega
Phone 1800 466 342
Online www.iomega.com/anz
Price 340M Microdrive with PC Card $599
1G Microdrive with PC Card $1,195

How we tested

A wide variety of storage products were sent in for review, including USB and FireWire-connected external devices and internal PC Card or EIDE drives. All of the storage devices were tested on a 1.4GHz AMD Athlon system, with 256M of SDRAM and a 20G IBM hard drive.

Individual Ziff-Davis Disk WinMark tests from Winbench 99 were run on all products, as were individual time tests to see how long file transfers took to and from the media. The two main tests, the Business Disk WinMark 99 and the High-End Disk WinMark 99, provide a measure of how a system's hard disk handles a load equivalent to that demanded by standard business applications.

The Business Disk WinMark 99 test requires 115M of free space to run, and the High-End Disk WinMark 99 test requires 340M of free disk space. These space requirements made testing the pocket storage devices with these benchmarks impossible. Similarly, the Iomega Zip 250 products in the personal storage category did not have the capacity to run the High-End Disk WinMark 99 test.

However, these two benchmarks are normally run to test hard drives that are used to read and write from constantly — something you are unlikely to do with a product from the Iomega Zip range. They are used in the reviews of those products to give an indication of read and write times for the drives, but provide more comparable information when run on the internal and external hard drives.

The time tests were performed with a digital stopwatch. We timed how long it took to write a 237M file *to* and *from* the storage media. This gave a good indication of speed — particularly in relation to the connection method and if that produced a bottleneck. *APC* Labs chose a file size of 237M because it came close to the maximum 250M that the Iomega Zip drives could handle.

The products used in these tests are shipping versions available to the public at the time of publication unless otherwise stated. All specifications details are submitted by the vendor and *APC* accepts no responsibilty for any errors within. WinBench and associated products are registered trademarks of the Ziff-Davis Publishing Company. These tests were performed without independent verification by Ziff-Davis and Ziff-Davis makes no representations as to the results.

Personal storage

Personal storage devices are similar to the products in the previous category in that they are small and portable. However, they differ from pocket storage devices in that they require their own disk media — and it's this requirement that makes them the *true* successors to the floppy disk. The units reviewed here have new disk formats that are as distinct from each other as they are from the humble 1.44M floppy. Welcome to the next generation of portable disks.

The capacities for these disks go through the roof — from 120M right up to 20G — and they have blazing speeds. Each requires a special drive to read and write to the disks; some are internal, others external. Internal drives require a second drive in another PC for copying between machines, but they are great for backing up. Other drives are portable, and can be taken from machine to machine for peer-to-peer copying, or stored off site for backups.

These devices run the gamut of connections, from internal EIDE to external FireWire and USB drives.

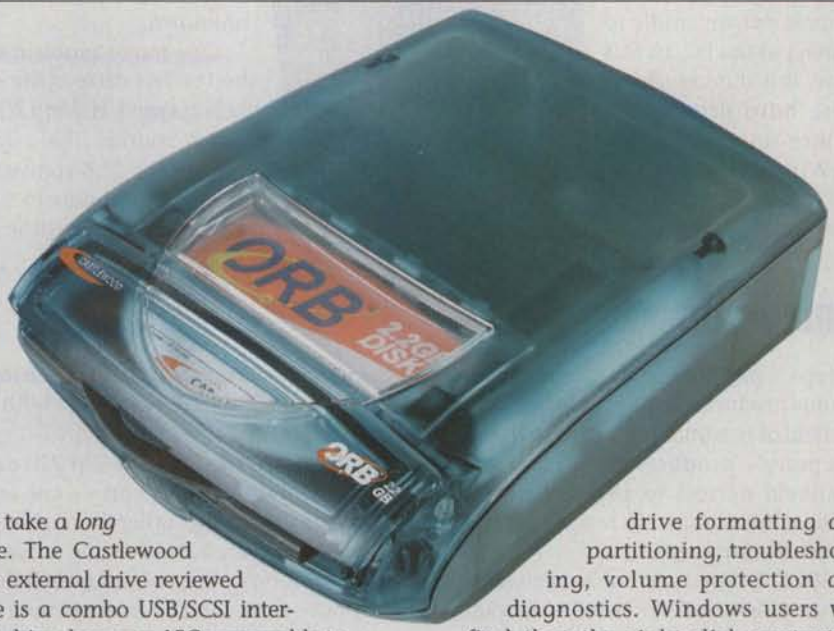
Castlewood Orb

Among personal storage devices, the Castlewood Orb range competes directly with the Iomega Zip and Jaz drives, because they are all disk-based storage media. They can't be compared directly with the Iomega Peerless drive, because the latter is essentially a disk casing containing a small hard drive, and the former is its own medium.

The Orb disks are slightly smaller than a Zip disk, but a little thicker. Benchmarking revealed that the drive's seek and write speeds are a lot faster than the Iomega Zip drives. This has a positive effect on its performance regardless of connection type.

Its 2.2G capacity is also very attractive. It is 200M more than the highest capacity Jaz disk, and almost 10 times the capacity of the 250M Zip. Speed is not always the crucial issue when shopping for a portable disk alternative, but capacity is, and the Orb has both in spades. *APC* Labs tested two 2.2G Orb drives — an external USB connection and an internal EIDE drive — as well as a 5.7G internal EIDE drive.

The USB connection is fine for removable media such as the Orb disk, but like the other USB-connected drives reviewed here, it was restricted by the USB transfer bottleneck. Copying a full 2.2G to the Orb disk can take a *long* time. The Castlewood Orb external drive reviewed here is a combo USB/SCSI interface drive, however *APC* was unable to test the unit at SCSI speeds because of hardware issues with the testing system. This is true of *all* SCSI products sent to *APC*.





If EIDE is a more feasible option for your setup, the third drive we tested should be of interest, as it takes the new disks that can hold 5.7G of data. At the moment, a 5.7G external FireWire drive is available (not reviewed here), but there are no USB drives at this capacity, and none on the drawing board. This is a good thing, as 5.7G is well above the threshold of data you'd want to try to copy from the PC to a device and back again using USB. In the benchmarks, connecting with EIDE saw much faster transfer speeds and more reliability.

Unlike the Iomega Zip and Jaz disks, the Orb disks are magneto-resistive (MR). Developed by IBM, MR technology keeps costs down as it allows manufacturers to squeeze more capacity onto existing media without restricting the current transfer and write speeds. Each of the drive kits includes a disk, but at $75 for a 2.2G disk and $140 for a 5.7G disk, the cost for extra disks is quite low. It is far cheaper than extra Jaz or Zip disks.

The drives come with Orb Tools, a selection of drive utilities that include drive formatting and partitioning, troubleshooting, volume protection and diagnostics. Windows users will find that the right-click contextual menu has most of the major Orb drive functions added to it, which makes using the drive easier. The entire Orb range works in Windows, but only the external USB drive works with Apple systems.

This is a great product for those looking for capacity over speed. Drive performance was good, but *APC* recommends buying the external USB drive only if you really need portability, or are running a Mac.

Pros Fast
High capacity

Cons USB connection can be slow

Contact Harvey Norman
Phone (02) 9211 3933
Online www.harveynorman.com.au
Price External 2.2G USB/SCSI (with 2.2G disk) $579;
Internal 2.2G EIDE (with 2.2G disk) $439;
Internal 5.7G EIDE (with 5.7G disk) $879;
2.2G disk $75;
5.7G disk $140

Iomega Peerless

APC first reviewed the Iomega Peerless drive in August (page 27), and little has changed since then. The latest in the Iomega portable storage range, the Peerless takes a normal notebook hard drive (the IBM DeskStar) and wraps it in shockproof packaging.



The Peerless has been reviewed in this category and not the external hard drive category because it requires its own cradle to connect to the PC. In this sense, it is different from those hard drives that require only a USB or FireWire cable.

The Iomega Peerless drive has to slot into a holder, which in turn slots into a connection device, which is in turn connected to the PC by FireWire or USB. This threefold connection chain has its advantages; for example, buying extra connection cradles is cheaper because you don't have to buy the entire unit. At the time of review, these extra cradles were not yet available, so prices are still unknown.

One major problem with the Peerless drive is the connection speed. Having 20G of storage sounds like a great idea, but the USB connection means it takes hours to fill it; and it takes only a little less time over the FireWire connection. However, if you're the patient type, these drives are excellent as backup devices or for storing data bit by bit.

Pros High capacity

Cons Excruciatingly slow under USB

Contact Iomega

Phone 1800 466 342

Online www.iomega.com/anz

Price Peerless USB or FireWire (with 20G disk) $1,095;
Peerless USB or FireWire (with 10G disk) $1,095;
20G disk $499;
10G disk $399

Iomega Zip

Iomega is positioning itself as the leading storage product company, particularly in the field of personal portable storage. The company's products range from tiny handheld devices to network attached storage, but it is the Zip range that is selling particularly well.

APC tested the external Iomega Zip 250 drives, which feature the now ubiquitous iMac-inspired clear plastic finish, and a rounded shape for the disks. These disks are made from titanium, and come with a five-year warranty, which is a vast improvement on the older disk's one year.

The Zip disk's maximum capacity is 250M. This is much lower than the 2.2G minimum size of the Castlewood Orb disks, but it is two-and-a-half times larger than the original Zip 100 disks. The drives are also backwards compatible with the old Zip 100 disks.



APC tested two external Zip 250 drives that run from the USB port — one externally powered, the other host powered. The host-powered drive is the more elegant solution of the two, because it draws its power from the USB port on the PC or notebook. It requires only one cable for data and power, instead of the two cables required by the externally powered drive.

However, a problem with this solution became apparent in *APC*'s testing. Sharing the power and data transfer along one cable resulted in a slight variation in the speed, particularly when copying to the drive, where it took an extra 25 seconds to copy the 237M test file. There was no noticeable time difference in copying the data back from the drive.

The Ziff-Davis Business Disk WinMark 99 test also exposed this performance glitch; the host-powered drive scored 437, but the externally powered drive scored 579. *APC* could not run the High-End Disk WinMark 99 hard disk test on the drives as it requires 340M of free space — more than the total capacity of the Zip disk.

The third drive tested was the original externally powered Zip 250 drive on a separately available FireWire adaptor — a tiny plug-in unit that piggy backs onto the Zip 250 drive by plugging into the power and SCSI ports, and has power and FireWire ports on the back.



The benchmarking revealed the FireWire connection to be much better than the pedestrian USB connection. A high score was achieved in the Ziff-Davis Business Disk WinMark 99 test, and a mere two minutes was taken to copy the test file to the drive. Surprisingly, test times for copying from the drive were slower than when the same drive was connected by USB cable. This must have been due to a problem with the adaptor.

The drives come with Iomega software and utilities. These are similar to the Castlewood Orb tools, including formatting, drive protection, troubleshooting and diagnostic utilities. Again, right-click contextual menu options are available.

The drives are all PC and Mac compatible, and fast enough under USB for the capacity of the disks, but *APC* recommends buying the FireWire adaptor as well.



Pros Small, handy floppy replacements

Cons Slow at times
Small capacity

Contact Iomega

Phone 1800 466 342

Online www.iomega.com/anz

Price External Zip 250 USB (with 250M disk) $549;
External Zip 250 USB host powered (with 250M disk) $469;
FireWire adaptor $179;
Zip 250 disk 2-pack $59;
Zip 250 disk 10-pack $275;
Zip U250 disk $35;
Zip U250 disk 5-pack $169

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Iomega Jaz



The big brother to the Iomega Zip range, the Jaz drive, with its 2G disks, is a direct competitor to the Castlewood Orb 2.2G range. The Jaz is an external drive and is natively a SCSI device. However, since we were unable to test SCSI devices, we used the two commercially available Jaz drive adaptors — one a SCSI-to-USB dongle, the other a SCSI-to-FireWire dongle.

Fitting the dongles was difficult; the adaptor had to be forced to fit under the trailing edge of the drive because the plastic extended too far. Aside from this slight hassle, the drive performed quite well in our tests. The Ziff-Davis benchmarks showed the drive to be quicker than the Zip 250 drives with USB connection, and much faster with the FireWire adaptor.



The times taken to copy to and from the media were some of the fastest in our tests. They trailed the EIDE-connected 5.7G Orb, but were much faster under both USB and FireWire than the other devices.

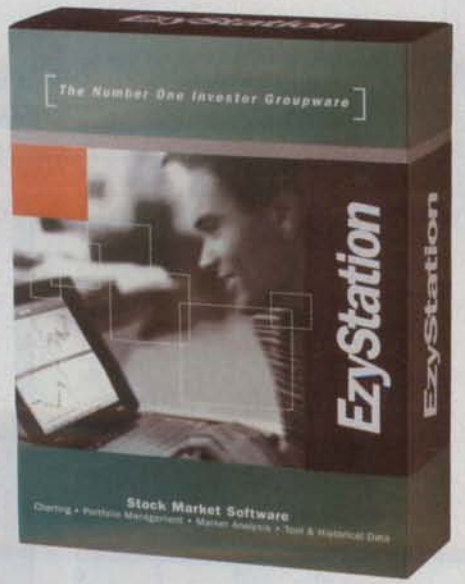
The Jaz drive comes with the same handy IomegaWare utilities and software as the Zip drives, and is PC and Mac compatible. It's more expensive than a 2.2G Orb, but the faster speeds may justify the cost for some buyers.

Pros Fast access and write speeds
Cons More expensive than other options

Contact Iomega
Phone 1800 466 342
Online www.iomega.com/anz
Price External Jaz drive (with 2G disk) $859;
1G disk 3-pack $649;
2G disk 3-pack $699;
SCSI to USB adaptor $179;
SCSI to FireWire adaptor $249

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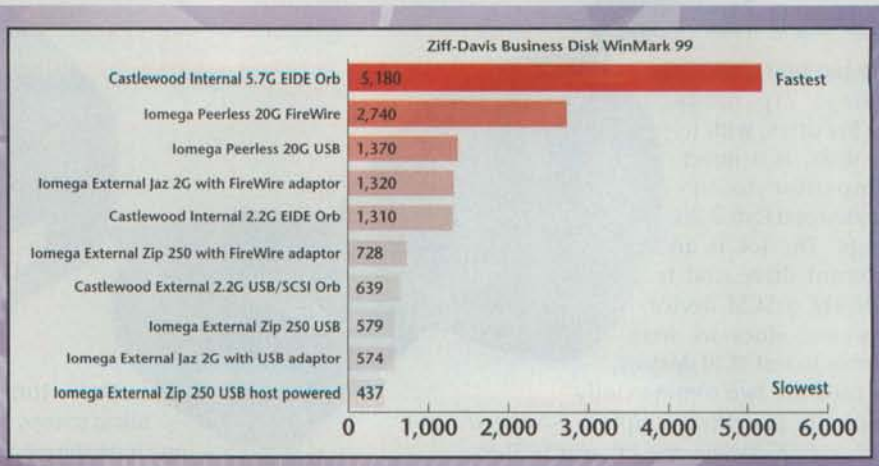
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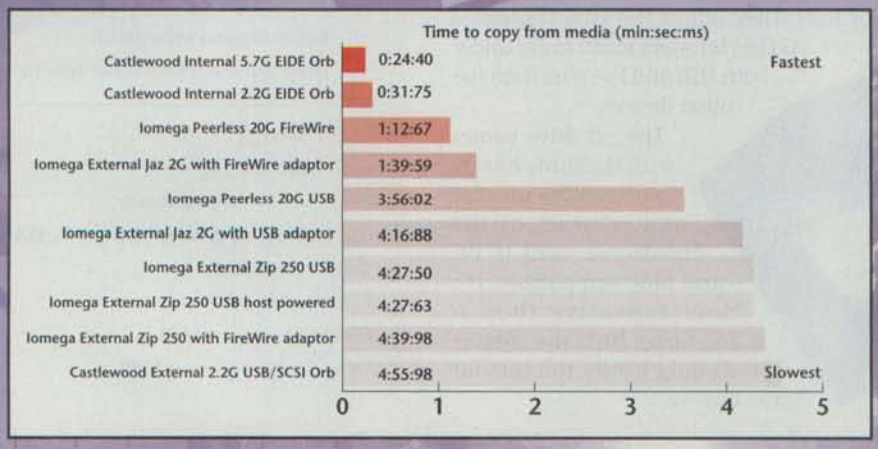
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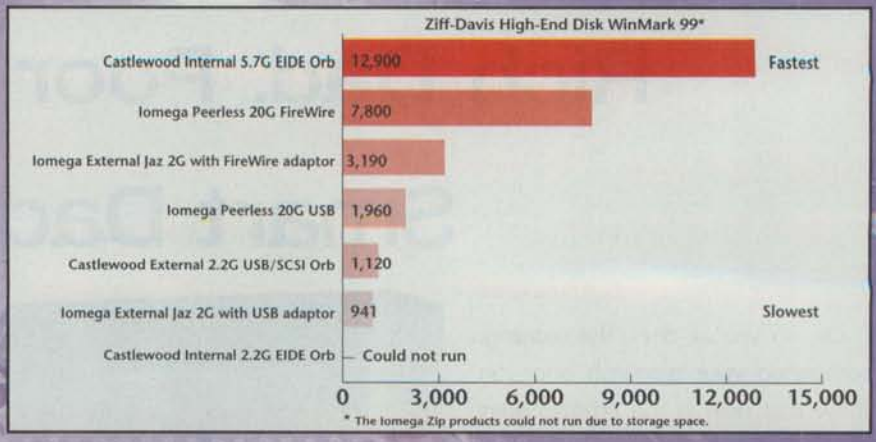
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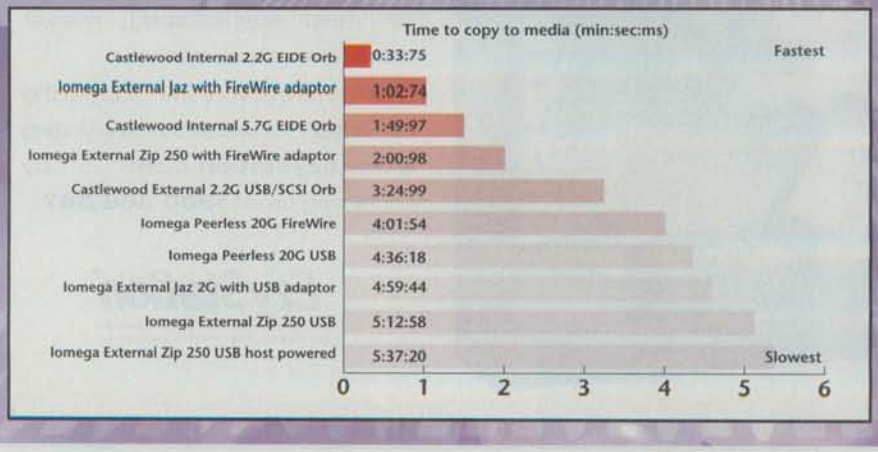
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External hard drives

The hard drive is the cornerstone of most PCs — it's where the data, operating system and applications are stored. Bang for buck, hard drives have the most capacity around. One of the Maxtor drives reviewed in the next category has a capacity of 100G. It's difficult to go past a hard drive for sheer space, but they aren't terribly robust — as anyone who has dropped one while installing it in a PC can tell you.

It is only in the past year that portable drives have begun to take off as alternative storage devices. The units reviewed below connect through the USB or FireWire ports on your system, and vary in capacity from 20G to 80G. The casings around the internal disks protect the drives from knocks and bumps, but some extend out like the crumple zones on a Volvo, which makes them less than ideally portable.

It is worth comparing the test results for these drives (page 82) to the personal storage results (page 78) and the internal hard drive results (page 87). Some of the test times are very similar for the different connection and media types — particularly for the hard drives fitted internally via EIDE or externally by FireWire. Comparing the results can give a good indication of the differences connection and media types can make.

Lacie 20G PocketDrive

The Lacie 20G PocketDrive is smaller than the other portable units because the internal disk is a 2.5in Quantum laptop disk, so unlike the other devices reviewed here, it can fit in your pocket.



The disk runs at a comparably slow 4,200rpm, and has 20G of storage capacity. It is something of a hybrid as it is the only external hard drive *APC* Labs tested that has both USB and FireWire connectivity.

This means that the benchmarking results table (page 82) lists two sets of results for the unit. It tested well in all of the benchmarks when connected by the FireWire port, but dropped well behind using the USB.

The drive case is an odd-feeling rubbery material that is by far the most shock resistant of any of the products in this category. The unit is light and compact, and this, combined with the two connection types and rugged casing, makes for greater functionality. However, it all comes at a price — a hefty $1,099.

Pros Small size
USB and FireWire in one unit
Cons Expensive

Contact Lacie
Phone (02) 9669 6900
Online www.lacie.com
Price $1,099

Lacie External SD2001 20G FireWire

This unit is based on the same 7,200rpm 20G IBM DeskStar hard drive that the Lacie External 20G USB drive (below) uses, but it has many advantages over that design. Most noticeably, the outer casing has a much better look and feel to it. Similar to the Maxtor 1394 External drives, the plastic casing is strong with a little bit of flex to it.



The second improvement is the FireWire connectivity, which allows the unit to rocket ahead of the slower USB-connected devices in the benchmarks. It also performed very well against the other FireWire-connected drives. The file transfer time to the drive was just over 10 seconds, which is just as fast (or faster) than some of the EIDE-connected drives.

The 20G unit costs only $83 more than the 20G USB drive, and is well worth that bit extra. There are also 40G, 60G and 75G IBM DeskStar versions available.

Pros Fast
Cons Not as sturdy as the Maxtor drives

Contact Lacie
Phone (02) 9669 6900
Online www.lacie.com
Price $590

Lacie External 20G USB

Lacie has a range of internal and external storage solutions for home and small business users as well as corporate customers. Its 20G USB drive is designed to satisfy the needs of all consumers. There is also a 40G version available (not reviewed here).

The unit is built around an IBM DeskStar drive, which runs at 5,400rpm. Unlike the other two Lacie external drives reviewed (or the Maxtor units), the casing is not very sturdy, and appears to be designed with little travel in mind. The drive's performance is nowhere near as good as that of the FireWire units, but is a little faster than the PocketDrive on its USB connection.



The SilverLining software and utilities included are very handy — there are drive formatting, partitioning and diagnostic tools. The unit is Mac and PC compatible. It isn't as portable or as robust as the Iomega Peerless drive (page 74), but it provides the same performance and capacity at a much lower price.

Pros High capacity for a good price
Cons Slow USB connection
Flimsy design

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Phone (02) 9669 6900
Online www.lacie.com
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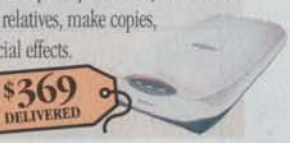
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1300 658 600

Maxtor 1394 External Storage

Maxtor is a leader in storage, so it is unsurprising that the company has produced a device in this category. The 1394 External Storage device arrived on *APC* Labs' doorstep in two flavours: the first was a 60G drive — which is more than ample for most needs — but it was the second drive's 80G that had our technical staff drooling.

The units are made from white and grey translucent plastic that looks a lot flimsier than it is. You can see the hard drive nestled inside the unit, and this adds to the air of fragility, but the moulding is extremely solid. There's just a tiny bit of give to cushion the drive should it get knocked or dropped.



Notwithstanding bottlenecks due to the device connection, the type of drive that is used has a huge impact on performance. The two units had different hard drives: the 80G drive had a 5,400rpm disk; the 60G drive had a 7,200rpm disk. The 80G drive was great for grunt work as shown in the Ziff-Davis Business Disk WinMark 99 test, but couldn't match the higher RPMs of the 60G drive in the other tests.

Compared to the other FireWire drives, the two Maxtor 1394 units performed very well. They took between 10 and 15 seconds to complete the file copy tests, which is similar to the faster EIDE-connected hard drives. These drives produced some of the best test results, and have huge capacities to match. They are compatible with Mac and PC, and come with good quality FireWire cables.

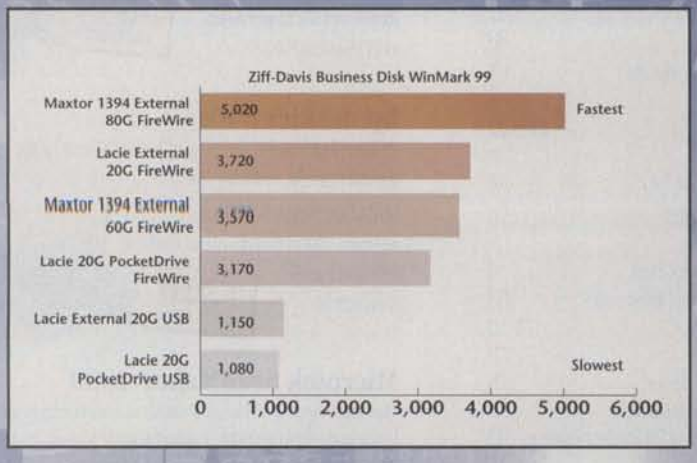


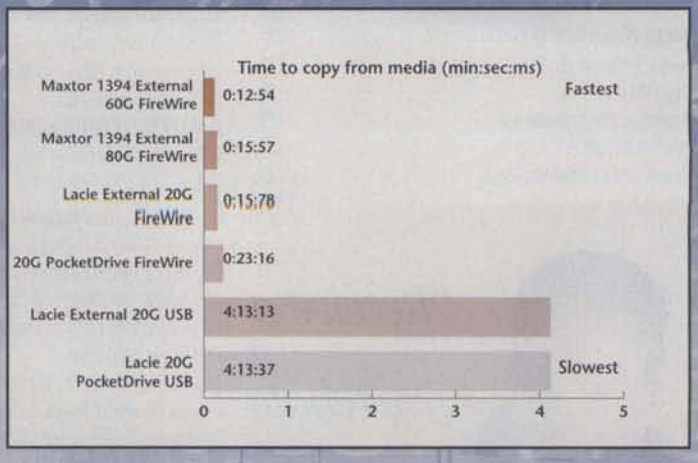
Pros Fast transfers
High capacities

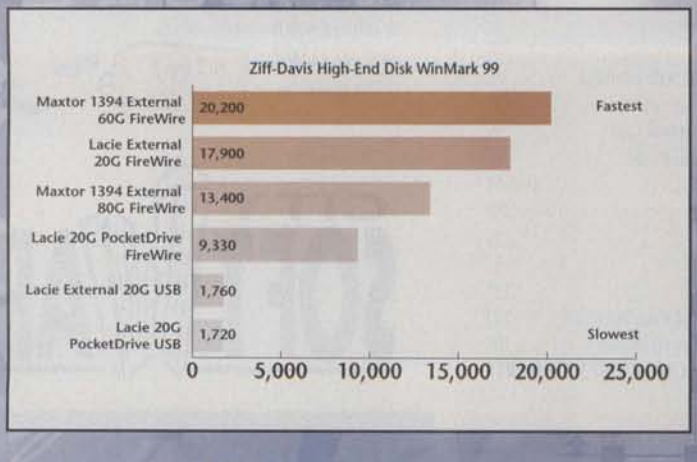
Cons The capacities push up the prices

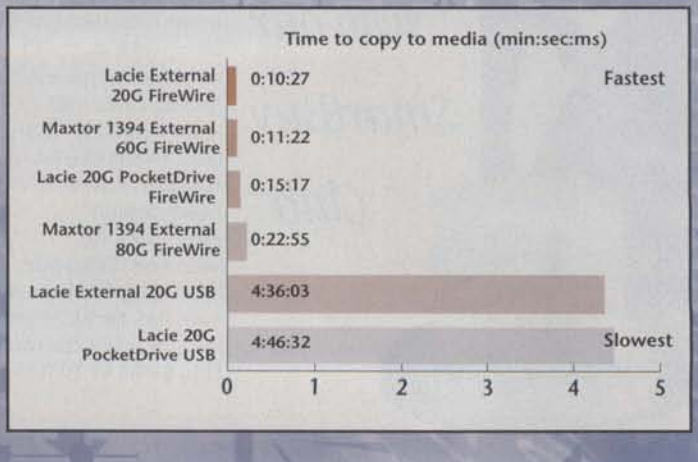
Contact Maxtor
Phone 02) 9369 3662
Online www.maxtor.com
Price 60G drive $999;
80G drive $999

External hard drive results









Internal hard drives



An essential component of the computer, the hard drive is often overlooked when we buy PCs. We only worry about the capacity. The hard drive is thought of as the place for backing up or storing data, but it is also the site from which *everything* runs. Hard drive speeds and performance are paramount in determining whether your PC runs like a dream or like a lemon.

Drives can run at 5,400, 7,200 and 10,000rpm, and are connected to the PC through EIDE or SCSI cables. EIDE comes in a few different bus speeds: 66, 100 and 133MHz. Before buying a hard drive, make sure your system's motherboard can handle the type you are buying. Sure, fast drives run on slower EIDE cables, but the effect is like buying a Porsche and never taking it out of first gear.

Programs are getting larger, and operating systems require much more storage than ever before, but hard drives are getting bigger at a rate that's outstripping software needs. In this review, *APC* looked at budget models as well as some of the largest capacity drives on the market.

A hard drive is a simple peripheral — it plugs in and runs. Speed and capacity are its two defining features, so *APC* has let the test results (page 87) speak for themselves, rather than review all the specifications and details of the individual drives.

Maxtor 536DX 100G

Pros Huge storage capacity
Only $695

Cons 5,400rpm is a little slow

Contact Maxtor
Phone (02) 9369 3662
Online www.maxtor.com
Price $695

Seagate Barracuda ATA IV 80G

Pros Exceptionally quiet
Fast
High capacity

Cons No serious failings

Contact Seagate
Phone (02) 8748 2700
Online www.seagate.com
Price $631

IBM DeskStar 75GXP 30G

Pros Fast in the Ziff-Davis benchmarks

Cons Slow to copy files

Contact IBM
Phone 1800 289 426
Online www.ibm.com.au
Price $346

Maxtor 541DX 20G

Pros Affordable price for an entry-level hard disk

Cons Lacks the speed of other drives

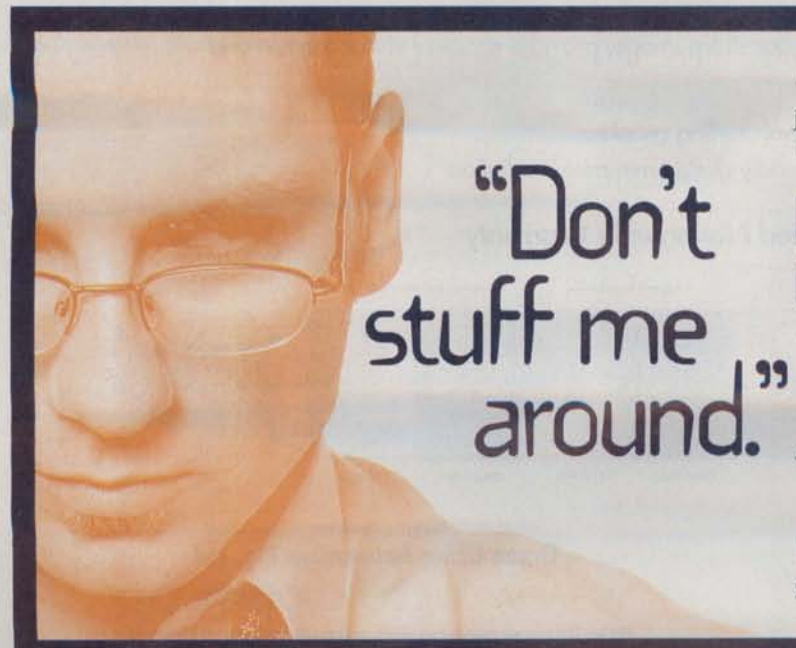
Contact Maxtor
Phone (02) 9369 3662
Online www.maxtor.com
Price $199

Seagate ST380020A 80G

Pros Large capacity

Cons Not as fast as the Barracuda, which costs only a little more

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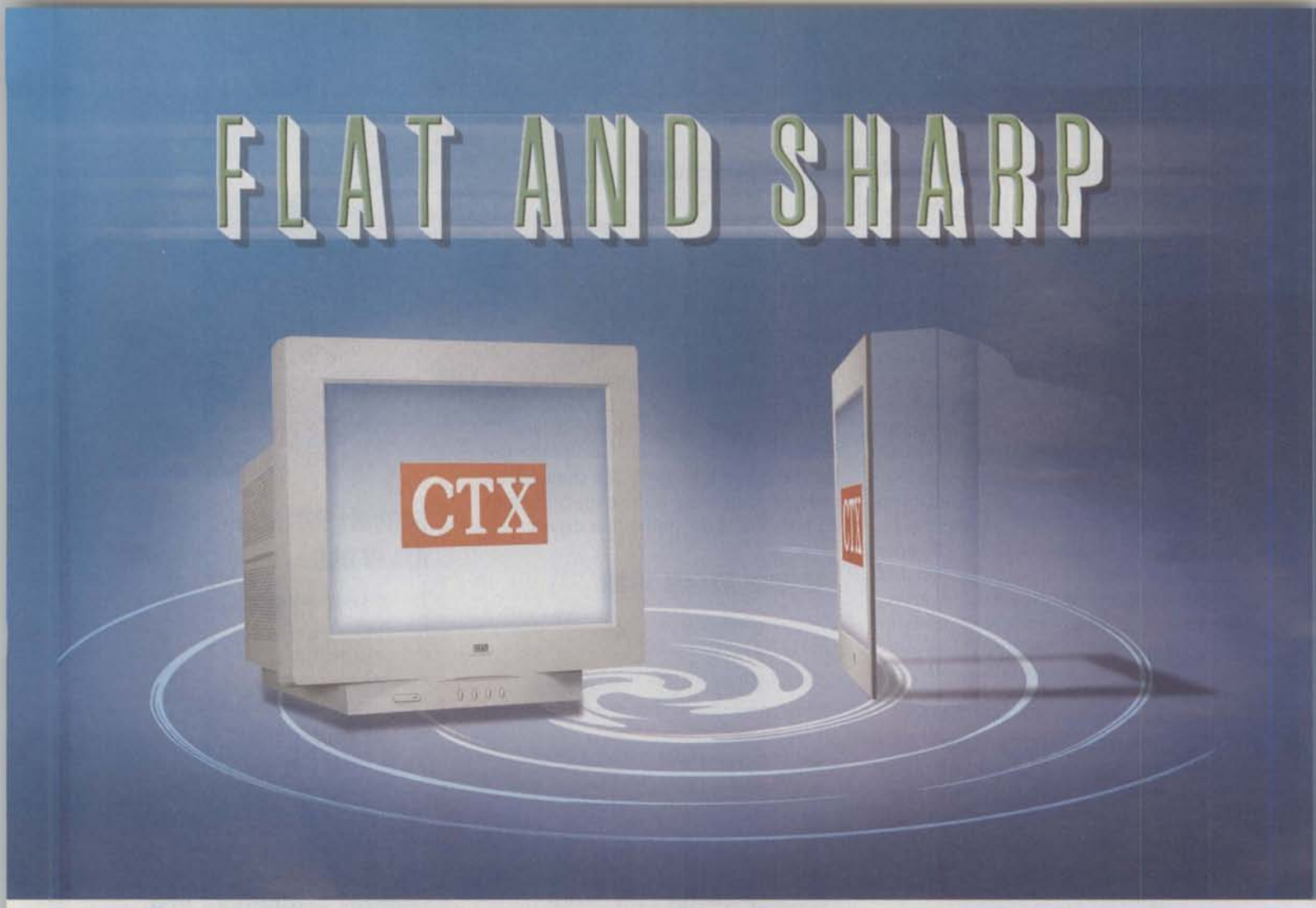
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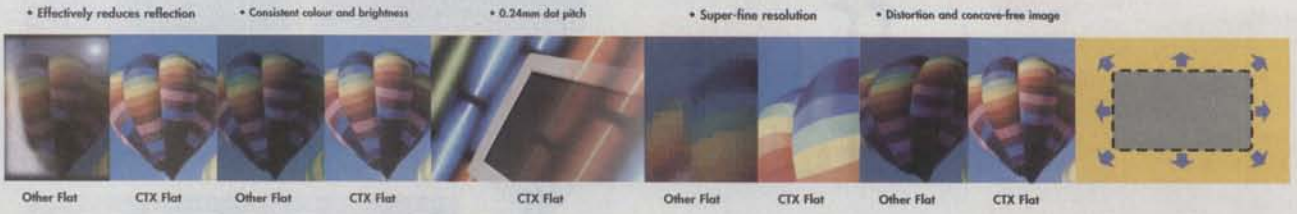
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- * Microsoft Intellimouse
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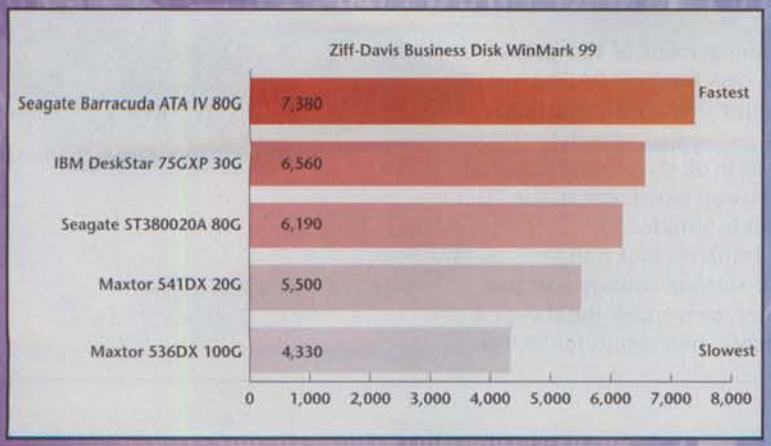
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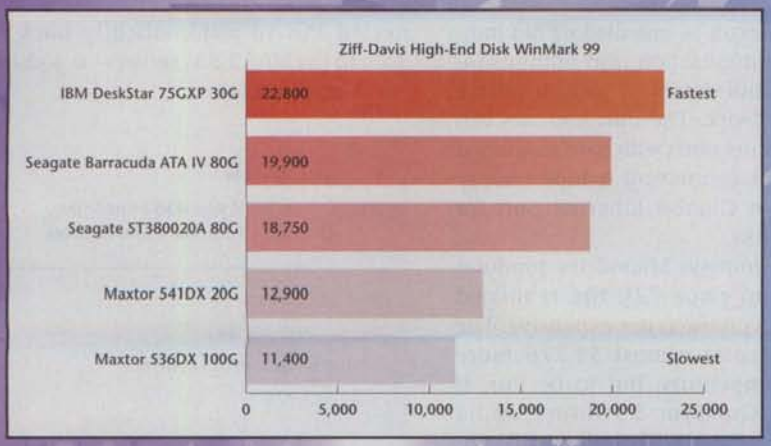
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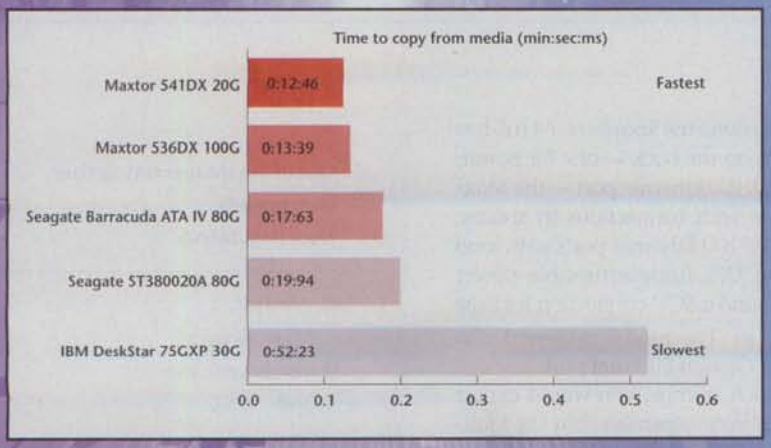
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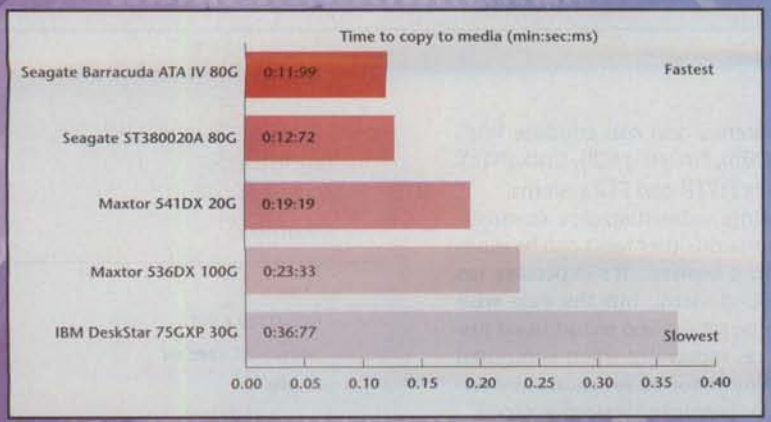
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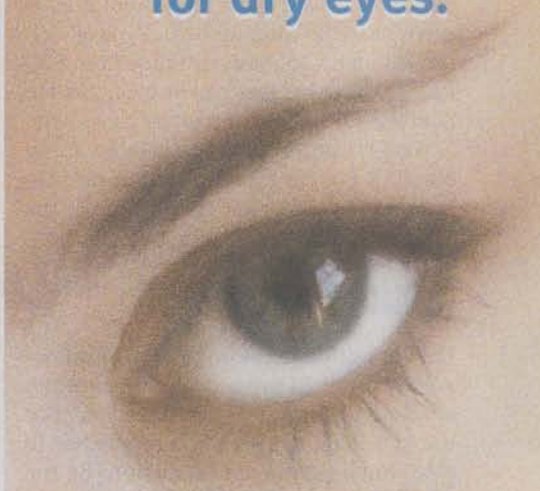








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Network-attached storage



Network-attached storage (NAS) devices are becoming increasingly popular with corporations. These devices sit on the network and offer a centralised space for general storage needs or for backing up data. Typical storage sizes for NAS products range from 80G up to 400G — but they can be configured to hold terabytes of data for larger customers.

The typical NAS product looks fairly bland. It has no external output devices, and only an Ethernet connection at the back. All management of the device, including access control, RAID hard drive configurations and data management is performed remotely. NAS products come in all shapes and sizes, but the three reviewed here come in the 1U rack-mountable form factor.

If you're thinking that hundreds of gigabytes of storage sounds like just what you need, be warned: the cheapest product reviewed here retails for $9,999.

Iomega NAS 320G

Network-attached storage devices do not vary greatly. At present, there are many similarities between the products that are available. Iomega is a newcomer to NAS, having launched a push to be the number one provider for all storage needs.

The NAS 160G (not reviewed) and the NAS 320G are Iomega's newest products. The company licenses the NAS units from Maxtor, so there are strong similarities between the Iomega NAS 320G and the Maxtor Max-Attach 4100. Iomega rebadges the Maxtor unit and sells it under its own banner.

The server can be installed within minutes, and configuration and administration are handled with a nifty interface over the network. The unit includes two 10/100 Ethernet ports with load sharing, a SCSI port for connecting a tape backup drive, and a Gigabit Ethernet port for faster networks.

Like the Iomega Microdrive products (reviewed on page 72), the rebadged Iomega NAS products are expensive. The NAS 320G costs almost $1,776 more than its competitors, but to be fair, it comes with QuikSync 3 software, and a huge 50-user licence. This allows 50 connected PCs to automatically back up data to the NAS 320G server — a godsend for IT administrators.

Pros Fast, reliable

Cons Expensive if you don't need the QuikSync 3 software and licences

Contact Iomega
Phone 1800 466 342
Online www.iomega.com/anz
Price $11,775

Maxtor MaxAttach NAS4100

This NAS device is similar to the Quantum SnapServer 4100. Quantum and Maxtor merged in 2000, so this is no surprise, but they're trying to keep their established product lines apart. Like the SnapServer, the MaxAttach NAS4100 has 320G of storage across four drives preconfigured in a RAID 5 array. It supports Windows (SMB/CIFS), Novell (NCP), Unix (NFS), Apple (AFP) or HTTP and FTP systems, and works straight out of the box with little configuration.

However, where the SnapServer 4100 has just two ports on the back — one for power, the other a 10/100 Ethernet port — the MaxAttach comes with connections in spades: power, two 10/100 Ethernet ports with load balancing, a UPS (uninterruptible power supply) port, and a SCSI connection for tape backup devices. The model re-viewed also had an extra Gigabit Ethernet port.

For so much storage, you would expect the unit to be very expensive, but the MaxAttach NAS4100 is relatively inexpensive.

Pros One of the cheaper NAS options
High capacity

Cons No serious failings

Contact Maxtor
Phone (02) 9369 3662
Online www.maxtor.com
Price $9,999

Quantum SnapServer 4100

The SnapServer 4100 is one of the latest products in the exceptional Snap appliance range from Quantum. *APC* first looked at a SnapServer 4000 a year ago (see *APC* September 2000, page 48) and was impressed. We're equally impressed with this version.

The 4100 model comes with a big 300G of storage on four drives, preconfigured in a RAID 5 array as standard. You can also order the unit with RAID 0, 1, or JBOD configurations. The device works with many operating systems, and can emulate Windows (SMB/CIFS), Novell (NCP), Unix (NFS), Apple (AFP) or HTTP and FTP systems.

File sharing, administrator controls, drive mapping and other tasks can be managed through a browser. It's expensive (as are most NAS devices), but the ease with which it can be set up and maintained justifies the price, especially when compared with the outlay required for manually setting up and maintaining a storage server.

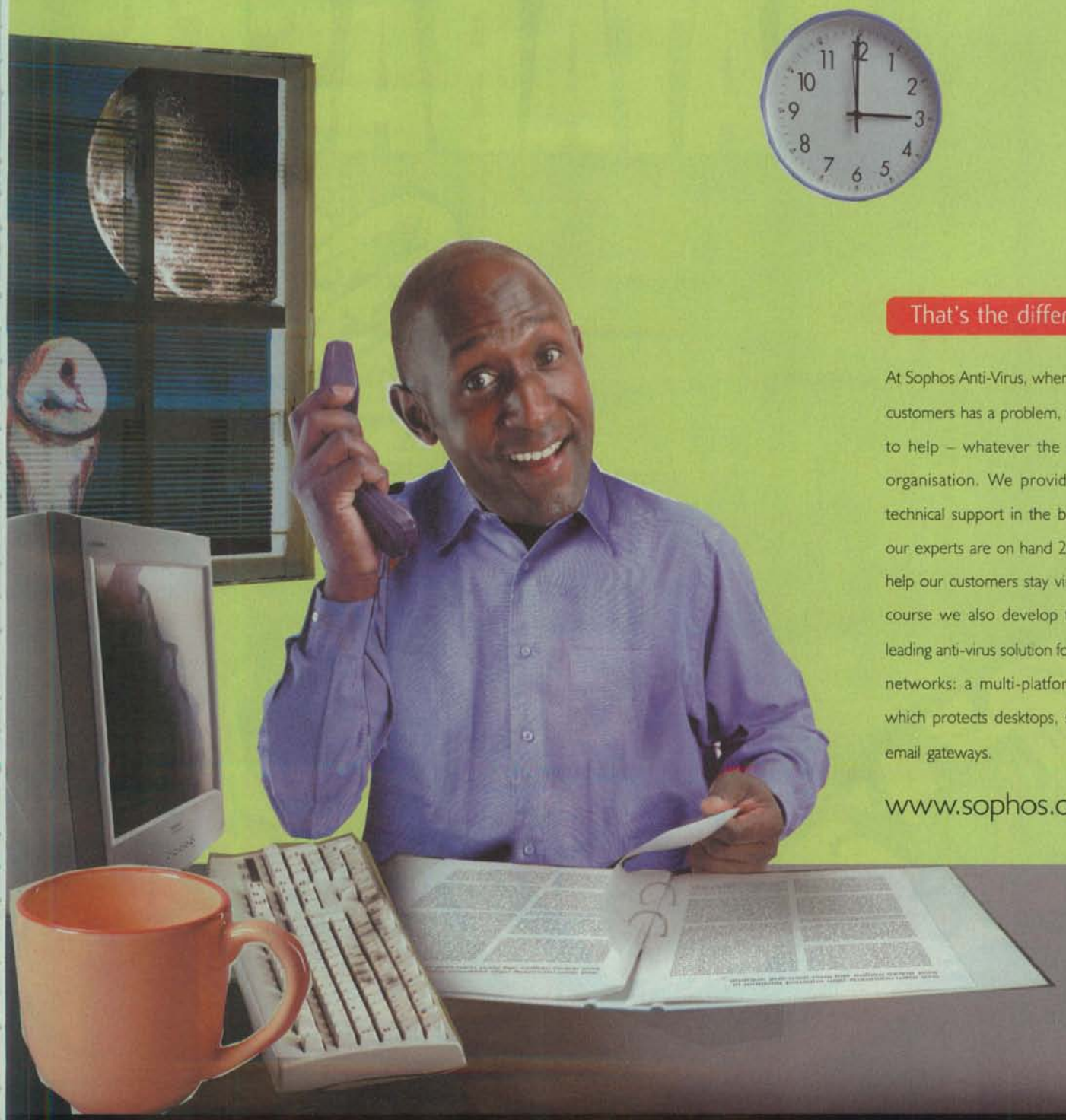
Pros Easy to use
Lots of storage

Cons Expensive

Contact Lan 1
Phone (02) 9319 6411
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DUELLING DATABASES





So you've decided you need a database program, but you're not sure which one to choose? The reigning champions, Access and FileMaker, take up the cudgels.
By ***Angus Kidman****.*

Databases are the poor relations in the office suite. Nearly everyone dabbles in word processing, and spreadsheets are common, but relatively few people use database software directly in their day-to-day work. This fact is reflected in Microsoft's decision not to include Access in its standard Office suite. In the history of the PC so far, this has been understandable; database tools were costly and difficult for anyone other than skilled developers to use.

Nonetheless, for maintaining large and complex sets of non-numeric data, databases are far more useful and flexible than spreadsheets (which are often the default alternative for nervous buyers). They've also enjoyed a resurgence in the era of the Web, because they can easily handle text and multimedia. They are the backbone of most major commercial Web sites. You may not be planning on building the next Amazon.com just yet, but anyone who uses a PC frequently will probably need a database program eventually.

Over the years there have been many contenders for the position of top PC database, but there are currently only two really significant ones. Microsoft's Access lurks on many desktops as part of more sophisticated Office installations and enjoys strong developer support, but it has suffered from a reputation for being difficult to use. FileMaker (spun off from Apple's software division) is generally deemed to be easier for non-technical users to work with, but it has been criticised for lacking muscle in larger business applications.

Both databases have a long development history and a well-developed community of users, and both have recently been updated in an attempt to address some of their perceived shortcomings. Access 2002 isn't included in the standard version of Office XP, but comes with the Professional edition, which will set you back an additional $200 (in both upgrade and new releases). FileMaker Pro 5.5 is slightly more expensive as a standalone product ($482.90 if you don't qualify for an upgrade), but cheaper if database software is all you're after. It also has slightly lower system requirements.

Choosing between the two comes down to features and implementation. *APC* has rated the two products according to their ability to perform six key tasks: building new databases from templates, importing data, mail merging, scripting and extensibility, query speed and publishing databases online. For each task, we've awarded a score out of 10. Who will be the database champion?

The contenders

FileMaker Pro 5.5

Contact FileMaker
Phone 1800 028 316
Online www.filemaker.com.au
Price $482.90 (new); $284.90 (upgrade)

Access 2002

Contact Microsoft
Phone 13 20 58
Online www.microsoft.com/office
Price $1,288 (new); $749 (upgrade)

And the winner is?

In a market that has developed to the point where only two competitors remain, neither choice is likely to be appalling. This certainly proved to be true in our database testing. The differences between Access and FileMaker were minimal in many areas, and both could be confidently recommended for most applications.

As our test scores indicate, FileMaker ultimately has the edge, largely because it concentrates on being easy to use, rather than on flexibility. Tedious tasks such as placing databases online or designing reports are made as simple as possible, but this doesn't detract from the product's potential as a powerful database development tool for general use.

Access comes into its own in two areas: users who imagine they'll be developing standalone applications in the near future; and businesses for whom mail merging will be a major part of their database activity. If these aren't your priorities, then the slightly less friendly interface presented by Access (especially in areas such as Web publishing) make it a less compelling choice.

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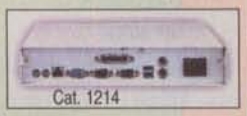
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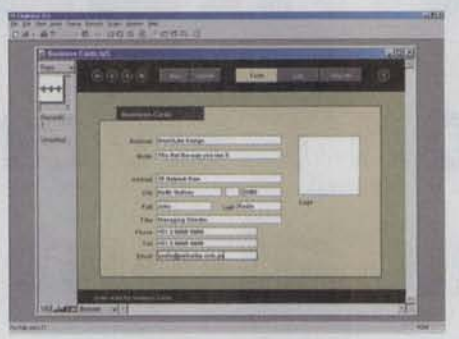
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Creating new databases

Early PC databases earned much of their reputation for difficulty because they required you to have a detailed plan for the data you wanted to store before you so much as put finger to keyboard. FileMaker and Access simplify this process with predefined templates that can be easily customised. For test purposes, we tried to set up a standard name and address database, one of the most common applications.

The approach of both products is initially similar: start a new database and select one of the predefined templates. FileMaker offers a total of 16 predefined templates, with an equal mix of home user options such as collection lists and recipe folders, and business choices like personnel records and expense reports. Once you have selected the template, you click on New and then begin adding records. The business card template contained all the fields we needed, and it was relatively easy to remove those we didn't want (by selecting the Define Fields option from the File menu) or add customised local options for fields such as state names.



Access has a slightly smaller set of predefined templates (10 in all), and a more obvious bias towards business users. Templates aimed at consumers are freely available from the Office Web site, which means there's a wide range of potential choices, but they're not as easily accessible.

The contact management template we selected produced a fully fledged application (as opposed to FileMaker's simpler set of cards). This is useful if the template matches your needs, but it is trickier to customise. For an application such as a simple mailing list, new users will be better off selecting a blank database and then using the Table Wizard to add the relevant fields from one of 25 sample tables.

The Database Wizard requires you to select which fields you want before beginning data entry, and it doesn't give you the immediate option of deleting fields you don't need. You can choose from a variety of background layouts, and the template automatically creates a front end for the database which allows data entry, report generation and other activities.

While both products make relatively easy work of setting up a new database, Access still makes fewer concessions to the new user, quickly requiring you to grapple with design views if you want to make even minor changes. The flexibility this offers is welcome when developing full-scale applications, but a little intimidating for the beginner. FileMaker has fewer complications, but beginners shouldn't have too much trouble with Access either.

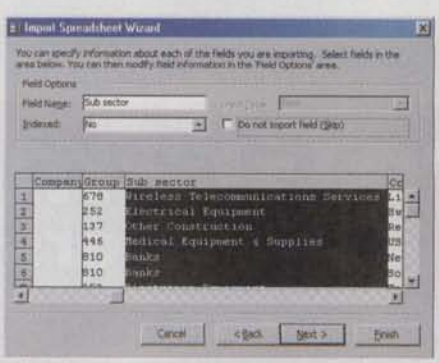
Access ▮▮▮▮▮▮▮▮▯▯

FileMaker ▮▮▮▮▮▮▮▮▮▯

Importing data

Very few databases are created entirely from scratch. More often than not, the data that needs to be stored in them is already accessible in another, sometimes less orderly digital form. The ability to import that data quickly and intelligently without numerous manual corrections is a critical test for any database. The data sources we used to test the import capabilities of each product included an Excel spreadsheet that contained information on 482 companies, a similarly formatted text file, and an email address book file from Outlook, exported in CSV form.

Both products enable you to customise data-importing operations so that only specific sets of information within the source data are used. This is a slightly fiddlier option in FileMaker, which uses drag and drop to reorder required fields. Access gives you a preview in table form, but the entire option to customise imports is easy to miss if you click the Finish button prematurely.





Although each system can make intelligent guesses as to the format of imported data, there are definite limits to such intelligence. For instance, both products can use the first row of data in a spreadsheet to map field names, but neither can manage this trick if such information is on any other line. FileMaker also has a handy option which allows you to import named ranges from within Excel, while Access supports the full range of cross-app copying and pasting options offered in Office XP.

On smaller data importing operations, Access and FileMaker both performed quickly (faster than we were able to time with a stopwatch in some instances). However, as the size of the file to be imported increased, Access demonstrated a definite advantage. For instance, importing the data from our 3.6M Excel test file took around 10 seconds in Access and 50 seconds in FileMaker.

We expected Access to perform more strongly in this particular test, given the expected levels of integration between different Office products, but the same phenomenon could be seen with a similar-sized text file. Access imported this in five seconds, but FileMaker took 30 seconds.

If you are expecting to import data regularly from other sources, these time differences could quickly pile up. That aside, there's relatively little difference between the two products in this area.

Access ▮▮▮▮▮▮▮▮▯▯

FileMaker ▮▮▮▮▮▮▮▮▯▯

Queries and reports

Once a database has been set up, there are two main uses to which it will be put: searching for individual data; and producing reports that summarise the data. There's very little separating our two competitors in these areas.

The most traditional measure of database performance is query speed: how quickly individual items of data can be located. While this remains a highly relevant measure for high-end databases, its application to desktop products has receded rapidly. The reason? Unless your database is enormous, most queries will be completed almost instantaneously.

Even on our test PC, which had just 64M of RAM and a relatively non-beefy 600MHz Celeron processor, we found few situations where searches weren't complete before we'd had time to remove our hands from the keyboard. Access appeared to be slightly faster than FileMaker in some cases, but not significantly so.

Access does offer more options for searching and filtering records. Both have the conventional filter-by-form option



(you specify the content of one or more fields and the database returns all the documents that match), but Access also allows you to select all records which match the currently selected field automatically, with a single click. This is much easier for simple queries.

Report generation (formatting the whole database, or a selection of it, for printing) is equally well handled in both products. Databases which have been built using existing templates generally have a selection of reports already prepared. For instance, FileMaker's business cards template includes a preformatted report for printing cards, while Access's contact management template includes a weekly call summary.

Setting up new reports is also well handled. Access offers a report wizard that will generate the basics for you, although to make any real impact on the output you need to access the somewhat less intuitive design view, which would do well with an adopted layout idea or two from Word.

FileMaker's report wizard is friendlier than that used in Access. Where the former offers you a range of functional styles such as envelopes and labels to choose from, the latter restricts you to choosing basic layout types. Once the reports are created, the editing environment is similar to that of Access.

Access ▮▮▮▮▮▮▮▮▯▯

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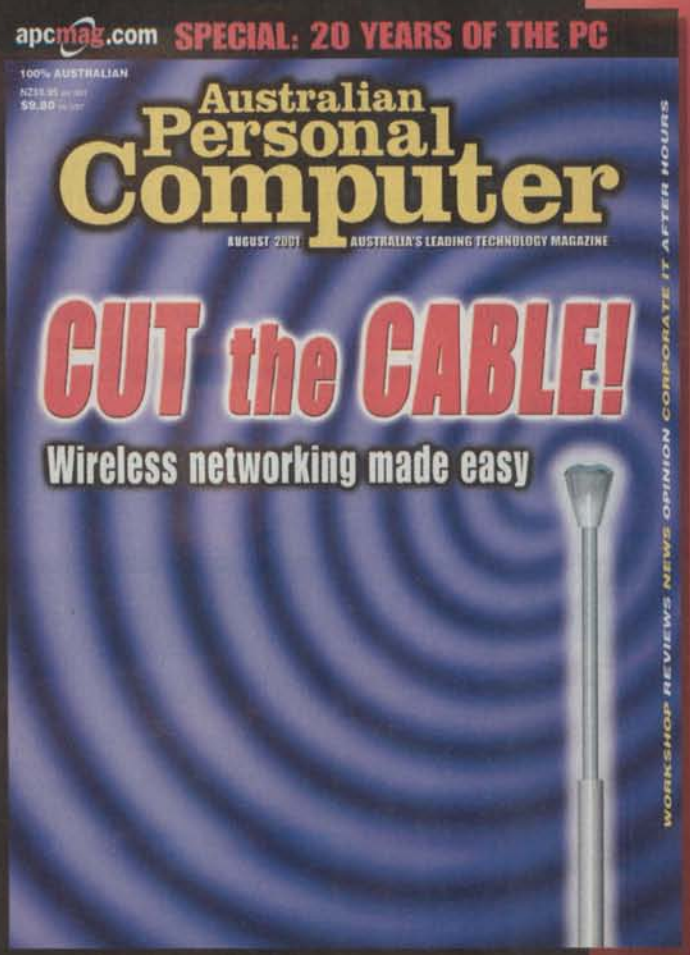
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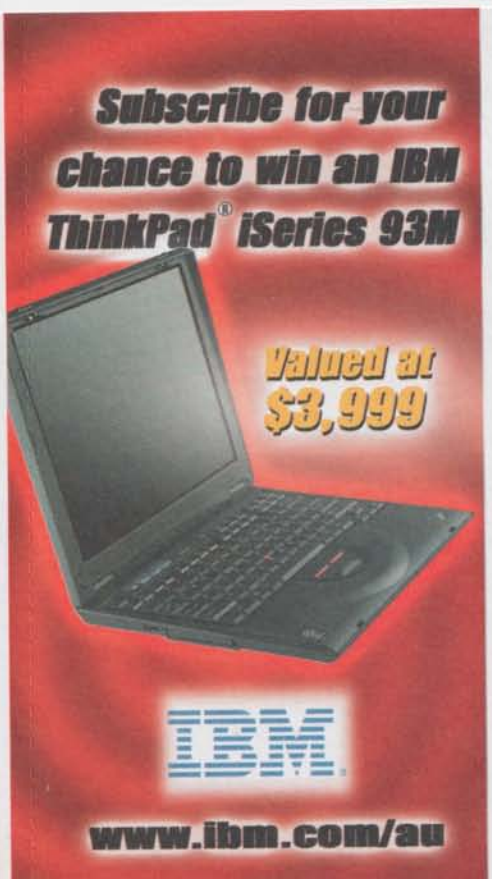
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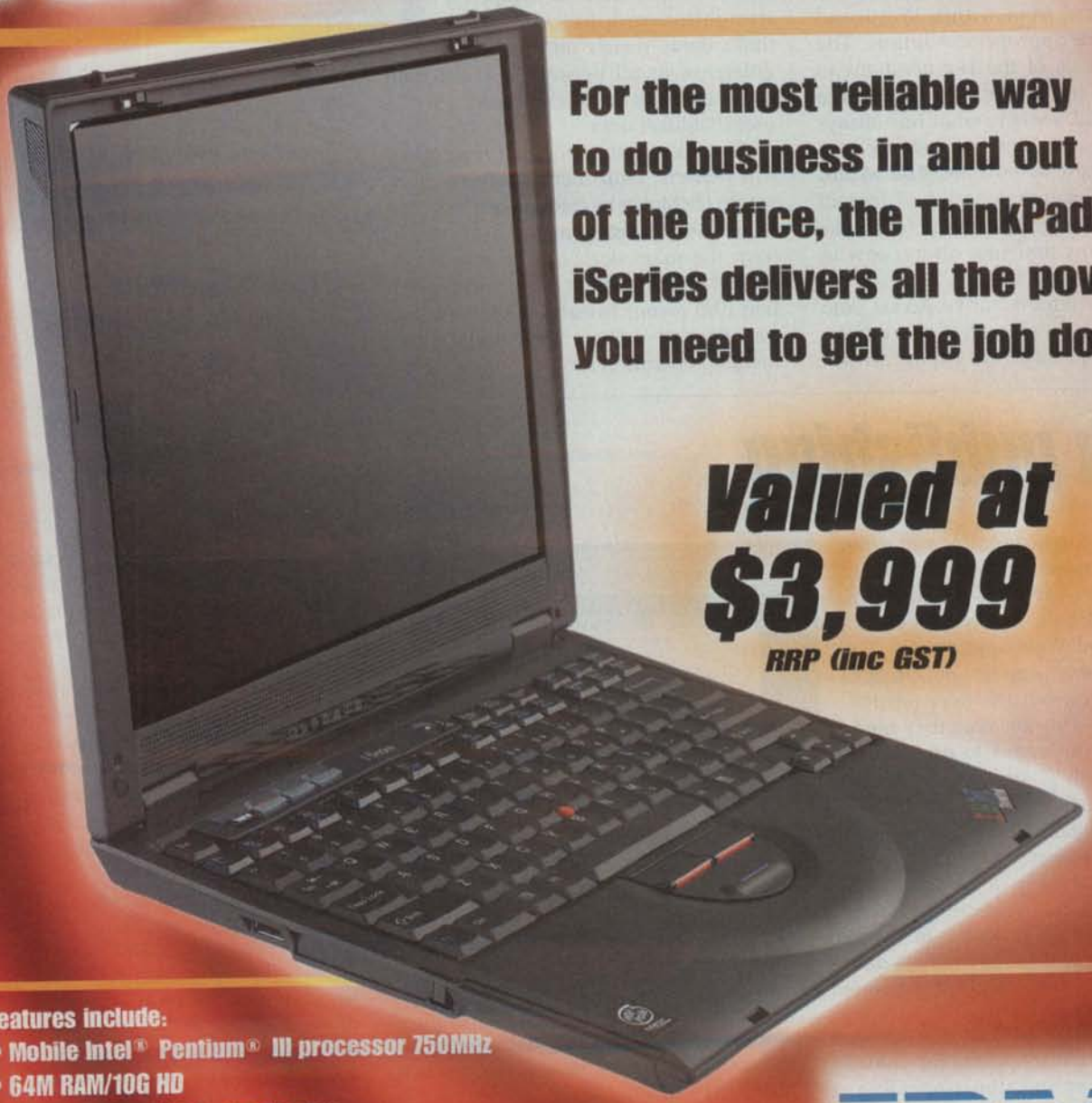
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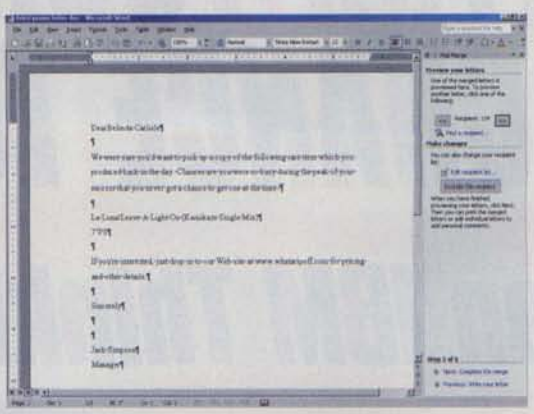
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Mail merging

Mass-producing letters for marketing and other purposes has always been an important application of the database. Mail merging has usually meant creating printed material such as letters or invoices, but in recent years, businesses have started to use mass customised emails as well.

Microsoft has an obvious advantage with this kind of application, since Word is already bundled with Access. Creating a mail-merged letter or email requires nothing more than activating the Mail Merge Wizard from within Word and selecting the appropriate option. The Task Pane (one of the key additions to Office XP) is put to particularly good use by this wizard, making what has always been a tricky task for many users about as straightforward as possible. The wizard takes you through a series of logical options, and you can backtrack and make changes at any time (not always easy in earlier versions of Office).

Word can import native Access data automatically , or you can choose a selection of merge data for export within Access. You can also restrict the fields available for inclusion in mail merge documents once the process begins, and there's a fast and flexible preview option.



Merging is clearly a straightforward activity using Access, but it's worth noting that it's Word, not Access, that is doing virtually all the grunt work. Although Word doesn't support directly importing FileMaker files, converting them into a format that it will accept is a straightforward process. Once that's done, there's no functional difference at all between a Word mail merge that uses an Access file and one that uses FileMaker data.

FileMaker users who don't have Word can perform mail merges directly from within FileMaker by creating a customised layout and inserting merge fields drawn from the main database. Although this doesn't offer the raft of document production and layout features that Word has, and doesn't include any direct email merging options, it's more than adequate for routine credit or marketing documents. Producing mailing labels with FileMaker is also straightforward.

Access is clearly the winner at producing mail merge documents. However, that isn't to say that FileMaker makes the task impossibly difficult.

Access ▮▮▮▮▮▮▮▮▮▯▯

FileMaker ▮▮▮▮▮▮▮▮▯▯▯

Web publishing

Publishing a database online can mean anything from exporting the data in static form by saving it as an HTML page to creating a highly customised, self-contained Web application. The products reviewed can handle either of these extremes, but we were particularly interested in how easy they made it to give secure access to an existing database with a similar interface. (There are further comments on self-contained applications in the 'Extended capabilities' section, page 100.)



Within FileMaker, it's particularly easy to allow database sharing. Enabling the Web Companion option in the File Sharing menu makes the database accessible with a browser, provided it is stored on a machine with an IP connection. Typically, this would be a dedicated server, but it is also possible for users on any network connection (including a dialup) to share data in this way.

Security privileges that have been set for the database (including passwords and editing restrictions) will continue to apply. It's possible to customise the interface, but the defaults supplied by FileMaker are more than adequate for most purposes. The standard release restricts Web access to 10 unique IP addresses within a 12-hour period.

Microsoft has worked hard to simplify the process of publishing data online in Access 2002, but it lacks the one-click simplicity of FileMaker. To publish a database, you create a data access page as a new database object. (These pages only work in Internet Explorer 5.0 or later.) This is then saved using either the Web Folders feature of Windows or a standard server upload.

When designing data access pages no defaults are supplied, but there is another wizard to take you through the process of creating them. It's possible to build sophisticated applications using this method, but for users with lesser demands, the process is overly convoluted and you need a working understanding of server naming conventions to ensure that the database is accessible to outside users. Once online, restrictions on user numbers will depend on the server.

Should you merely wish to provide static data snapshots, both products also offer a standard HTML save option. Access allows you to use HTML templates to customise the final output, but produces much larger files even if you don't use that option. In our tests, sample HTML pages were almost twice as large, despite no notable differences in the finished output.

Access ▮▮▮▮▮▮▮▯▯▯

FileMaker ▮▮▮▮▮▮▮▮▮▮▯

WE'VE REWIRED THE BULLETIN



www.ninemsn.com.au/bulletin

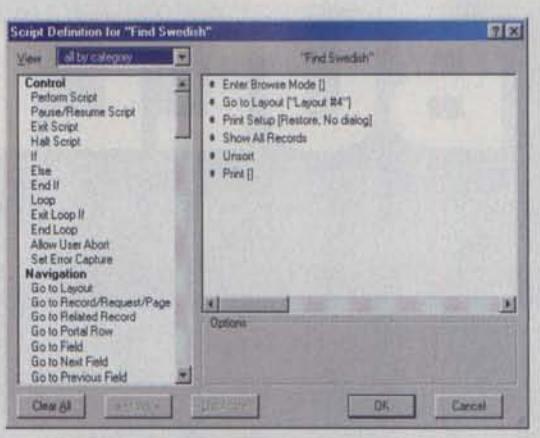
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Extended capabilities

Unlike most applications, databases are often designed to be invisible. Extensive scripting controls mean that rather than simply telling users to use standard desktop software to retrieve and enter information, developers can create standalone applications customised for specific divisions or individuals. This helps to shield those users from unnecessary difficulty, and also makes it easier to maintain data security and limit updates to authorised parties.



While developing such applications is unlikely to be an area that database beginners will dabble in, it's useful to know that such extensions are possible. After all, if you don't fancy developing a complete solution yourself, you can turn to one of the many solution developers who work with both products. (There are more developers for Access than FileMaker, but there are plenty of consultants who work with both). Both Access and FileMaker perform well on the extension front; each boasts its own scripting language, can interact with larger enterprise databases, and supports XML as a data exchange medium.

Access often gives the impression that its primary function is to develop standalone applications rather than to be used as an environment in its own right. If that's your aim, Access can well and truly deliver the goods, allowing you to incorporate data from other Office applications as well as database information (from Access and other enterprise environments) into your custom apps. The extensive help documentation provided is thorough and useful, even for beginners. Automation at a simpler level can be accomplished using the built-in macro editor.

FileMaker's options in this area are less extensive, but it's still no slouch. Its ScriptMaker tool enables complete control over the user interface, and is particularly useful in creating custom summaries of data or simplified front ends. The addition of full ODBC access in the more recent versions of the product also makes connecting to enterprise systems a simpler task than in earlier releases.

If you imagine that your database needs will expand, but don't want to expend a lot of time and energy learning how to use the tools you need, FileMaker remains a viable choice. If you want unlimited flexibility, Access is the best option.

Access ▮▮▮▮▮▮▮▮▮▮
FileMaker ▮▮▮▮▮▮▮▮▯▯

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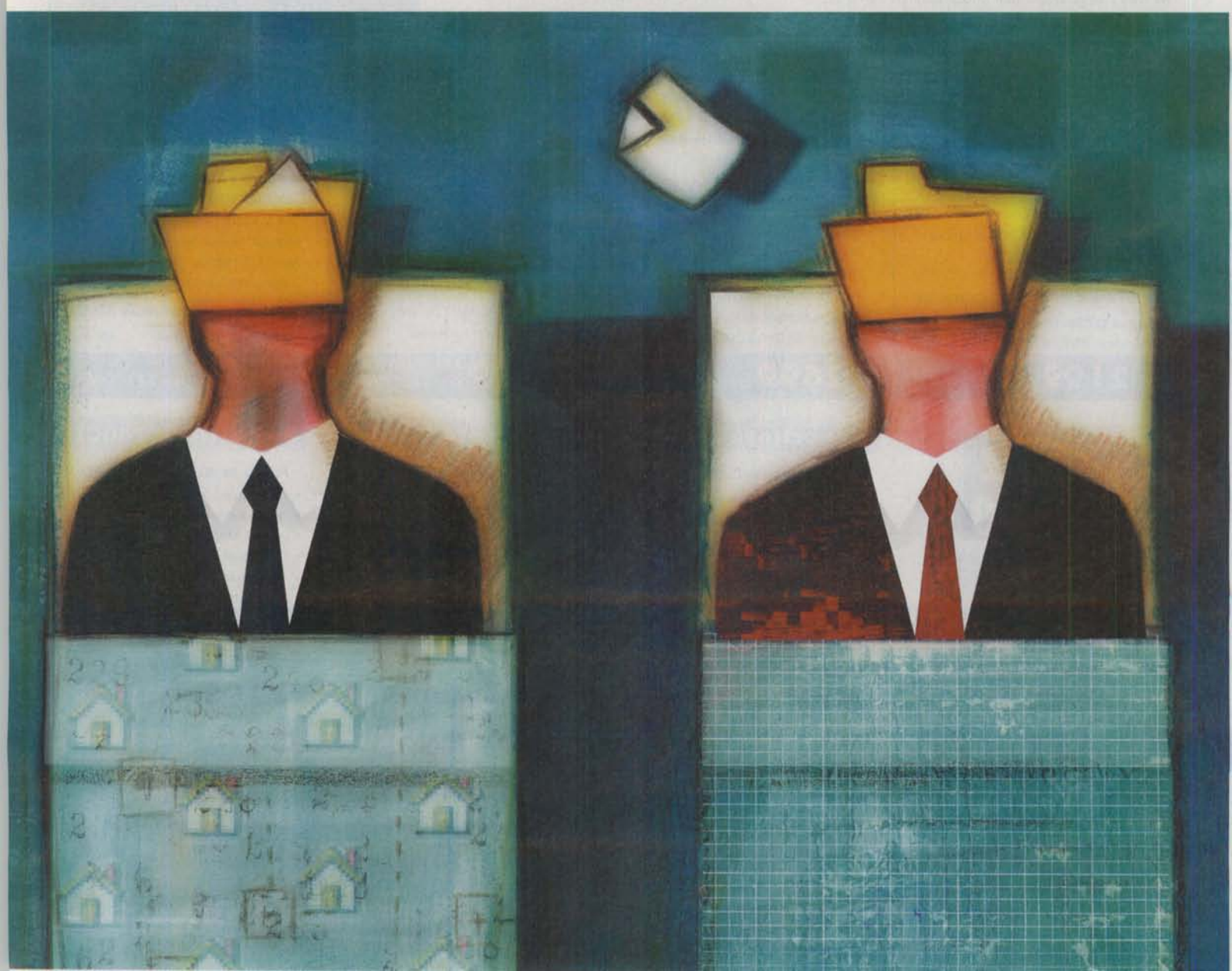
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intel inside pentium 4

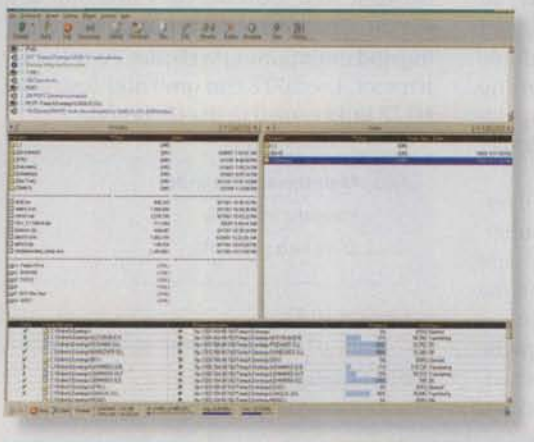
FTP face-off

FTP is an integral part of the Web. It's the default protocol for transferring files over TCP/IP, and it's how most Web pages are updated. The secret to the effective use of FTP has always been choosing the right FTP client for your requirements. Site administrators frequently upload and download large numbers of small files, so their needs differ drastically from those of the average user, who might only use FTP to download the occasional large file. ***Daniel Gardiner*** *reviews the latest generation of FTP clients.*



3D-FTP 4.0

This client hopes to make its mark with a highly customisable interface, solid basics, and a few great extras. It works like Winamp and other MP3 players, and has community-created 'skins' to change the look of the program. Quite a few skins are available on the 3D-FTP Web site.



Its most interesting and unique feature is its Multiwire transfer engine. If you select an entire directory of files to download, 3D-FTP initiates multiple simultaneous connections and downloads several at the same time. Dialup users probably won't notice the speed difference, but broadband users will. However, many FTPs restrict the number of times you can connect, so there are many sites for which Multiwire does not work.

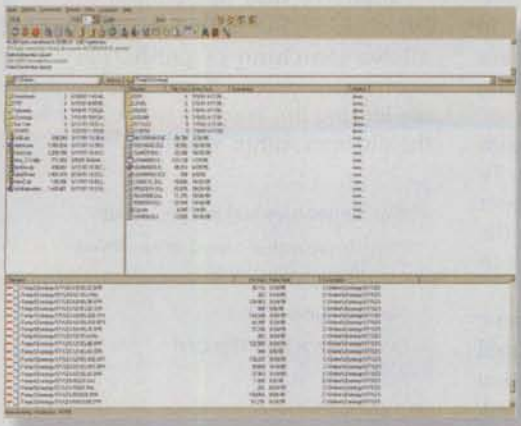
Multiwire also comes at a price: 3D-FTP hogs memory and other system resources. *APC* ran it on a freshly booted Athlon 1GHz with 256M of RAM and it was only possible to open three 3D-FTP sessions. Using other FTP programs, it's possible to run up to 10. Still, if you're in the business of uploading and downloading large groups of files, 3D-FTP has some useful features.

Pros Multiple simultaneous downloads
Customisable look
Cons System hog
Multiwire doesn't work on some sites

Contact SiteDesigner
Online www.3dftp.com
Price $US29.90

Bulletproof FTP 2.3

This good all-rounder has some unique extras. Like CuteFTP (reviewed below), BPFTP can catch FTP links from the clipboard. It can also grab HTTP links; this is one of its most useful features — you can use BPFTP to download files via HTTP, and you can resume the file download if it breaks halfway through.



It also comes with some high-level options, such as automatic creation of site mirrors on connection to a server, and caching of the entire directory structure so you can browse the site offline.

Another of its handy features is the 'Find files' option, which is similar to the one found in Windows Explorer.

BPFTP's only notable failing is that when you cancel a download, it often continues transferring. You have to wait until the entire file has completed, or disconnect (which can be annoying if you've been waiting to get on to the server), to stop the transfer. The program's user interface has also been criticised for being more functional than flashy.

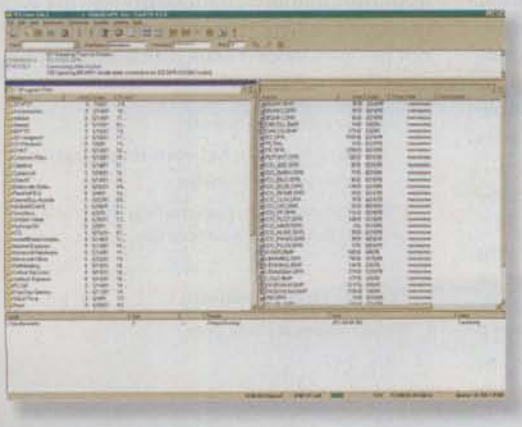
If you're after a no-frills FTP client with very strong functionality and some great extras, Bulletproof is a good choice.

Pros Good basics
Useful and unique extra features
Cons Interface is a bit utilitarian
Transfer cancellation can be a hassle

Contact Bulletproof Software
Online www.bpftp.com
Price $US29.95

CuteFTP 4.2 and CuteFTP PRO 1.0

This is one of the most popular FTP clients available, and it's easy to see why. It's easy to use and has lots of extra features and settings for more advanced users. It's almost the default standard for FTP clients.



CuteFTP has a clean interface based on the standard four-window model (one for logging, one for the local PC drive, one for the remote PC files, and an upload/download queue). It also has a good toolset and shell integration, which means that the program can handle any FTP link copied to the clipboard or clicked on in your browser. CuteFTP's handling of FTP links was quite good.

Transfer queues can be used at a later date (or copied to another PC) by saving them as QUE files. These files are also used in CuteFTP's transfer scheduling, which lets you set specific dates and times for uploads or downloads. Transfer scheduling is particularly handy for Web site administrators who need to update a specific page on a regular basis.

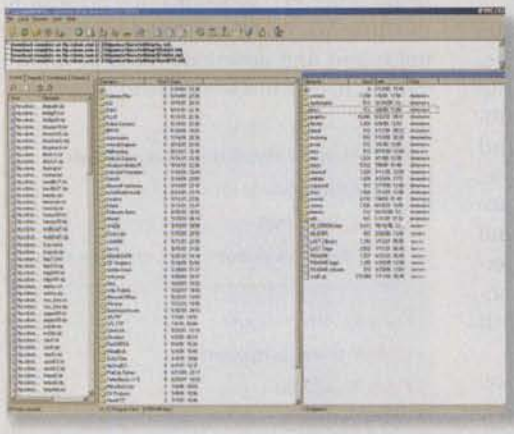
The Pro version has extra features (such as SSL transfers), but most people will find these unnecessary.

Pros Great general package
Good starting point for new users
Cons No serious failings

Contact GlobalSCAPE
Online www.cuteftp.com
Price CuteFTP $US39.95
CuteFTP Pro, $US49.95

LeechFTP 1.3 (build 207)

Although the group that was developing this freeware client disbanded over two years ago (the most up-to-date version was released in April 1999), the program is still very popular. It has all the basic features of its successors, as well as other aspects which are only now being incorporated in more recent products.



LeechFTP is able to initiate multiple file transfers simultaneously, allowing you to download much more rapidly than you can with standard 'single-thread' FTP programs.

It has a fairly clean, standard interface, similar to CuteFTP and Bulletproof. Like most larger clients, files are queued in a separate window, and the user can decide when the queue is transferred. Leech also has a queue timer, which works like a basic scheduling agent, allowing you to specify a time and date for your queue to transfer. In addition, it has a directory comparison feature, which checks file sizes and dates between your local directory and that of a remote computer. This is handy for updating and maintaining Web sites. As with Bulletproof, LeechFTP can grab and download HTTP links copied to the clipboard.

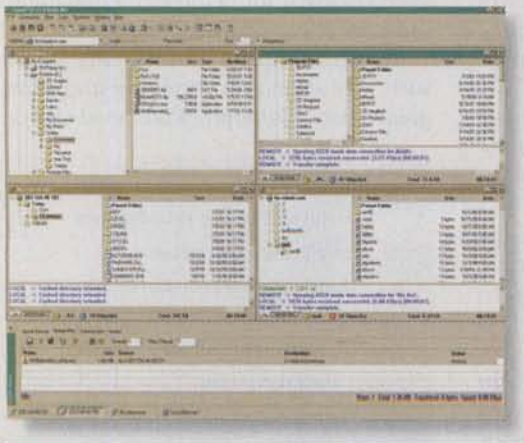
Pros Multithreaded transfers
Pleasant interface

Cons Over two years old

Contact N/A
Online stud.fh-heilbronn.de/~jdebis/leechftp
Price Freeware

SmartFTP 1.0 (Build 961)

SmartFTP differs from the other clients reviewed here in being able to handle multiple FTP sessions using a single client. Each FTP site opens a window in SmartFTP's main window. The screen pictured here has four sessions open. You can switch between them using a taskbar-like menu at the bottom. This works well if you want to browse multiple FTP sites, and requires fewer system resources than opening multiple copies of other FTP clients.



Basic file downloads and uploads are handled with drag and drop. To download, you open a local browser window and drag the files from the remote PC to a local directory. To upload, you do the reverse.

Downloading files using the queue can be tiresome. Files must be dragged to the queue, then to the destination folder, before they can be downloaded. However, FXP — transferring files between FTP sites — is handled very well, using the same drag-and-drop and queuing methods.

SmartFTP also has built-in access to Lycos's FAST FTP Search 4.0, but it only allows searching of public FTPs with anonymous access. If you find what you are looking for, you can connect easily to the site from within SmartFTP.

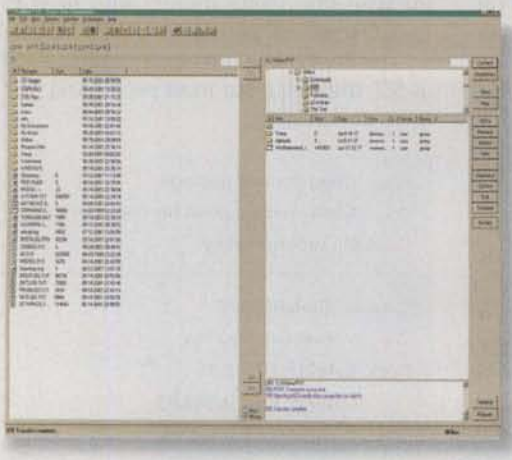
Pros Innovative and unique layout

Cons Some aspects need streamlining

Contact SmartFTP
Online www.smartftp.com
Price Free

Trellian FTP 2.06

Trellian FTP is another client that handles the basics fairly well, and it has some useful extras. For example, like 3D-FTP and LeechFTP, Trellian supports simultaneous multiple file transfer. It is easy to distinguish whether you want files downloaded or uploaded individually or concurrently, thanks to separate buttons for each transfer mode (">>" is single transfer, ">>>" is multiple). However, the current version seems to lack the ability to download directories using the multiple transfer method — only groups of files can be selected.



Another feature is Trellian's ability to 'hammer' FTP sites. On busy FTP servers that are hard to log on to, you can use Trellian to try to reconnect at very short intervals. This will work with most larger sites, but many smaller FTP sites specifically ban users who try to reconnect too frequently, because it can crash the server. Hammering may result in you being unable to log on at all.

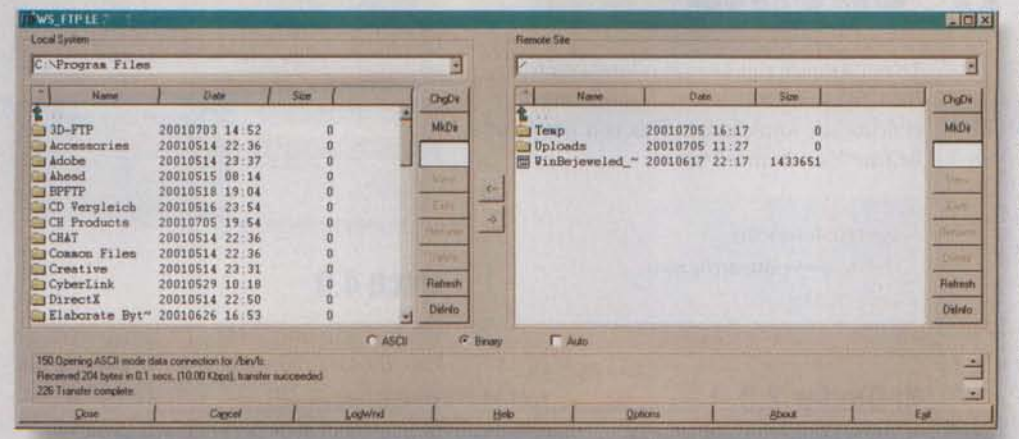
File queuing is handled by the Batch Transfer option. This allows you to queue from multiple sites, then download the files in sequence. Unfortunately, directories cannot be downloaded using the Batch feature.

Pros Handles basics well
Easy to switch between single and multiple file transfer

Cons Has problems transferring directories in Batch and multiple file modes

Contact Trellian Software
Online www.trellian.com
Price $45

WS_FTP Limited Edition 5.08 and WS_FTP Pro 6.7



For file operations, WS_FTP Limited Edition is based almost entirely on drag and drop. Its most interesting innovation is that it does away with the file queue window altogether. To download, you select files from the remote window and drag them to your local PC. To upload, you do the reverse. This works quite well in practice, but advanced users may find the inability to see which files they've queued up annoying.

WS is also configured to handle different types of FTP servers with different commands. Each FTP server differs subtly as to which commands it can issue and receive. This means you occasionally encounter problems where your FTP client can't communicate with the server, simply because it doesn't know which language to use. WS usually overcomes this by allowing you to select which type of server you're connected to, or by automatically detecting it itself.

The Pro version retains the same two-window structure, and heaps a ton of extras on top as well, such as secure (SSL) transfers and transfer scheduling. It also has 'WS-FTP Synchronization', which allows you to match the contents of a local and remote PC. For example, you can set your work PC to log on to your home FTP server and update your work documents (or vice versa). It can also be set up to compare dates on files to ensure that the local computer and the remote have received the most up-to-date files from each other.

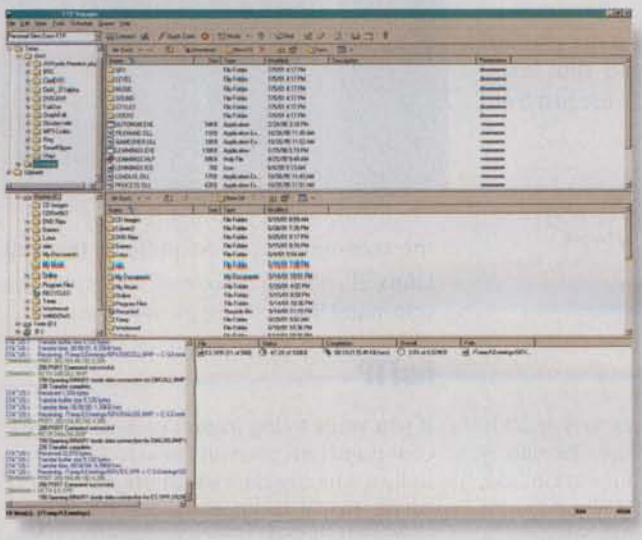
Like Bulletproof, WS_FTP Pro also has a 'Find files' utility, which works well, but can take some time on larger sites.

Limited Edition is a reasonably simple client, and is good for people who don't need or want too much from their FTP program. Site administrators and those using FTP on a day-to-day basis

Pros Good use of drag and drop
Extra features are very polished
Cons No visible file queue

Contact Ipswitch
Online www.wsftp.com
Price WS_FTP Limited Edition, free
WS_FTP Pro, $US39.95

FTP Voyager 8.0



This is another great all-rounder, and combines some of the best features found in other FTP clients. *APC* was initially put off by Voyager's rather unconventional window layout, but we soon discovered that it has the same functionality as CuteFTP. Browsing has been refined by the inclusion of a root folders window, which makes browsing sites similar to using Windows Explorer.

Like WS_FTP Pro and several of the other programs reviewed here, Voyager has a comprehensive scheduler that allows you to schedule specific tasks, such as uploads, downloads, deletion and synchronisation. It is one of the best *APC* came across — easy to use but full featured. It also has a quicker synchronise option that allows you to specify local and remote directories (along with synchronisation parameters) quickly, and then leave Voyager to do the work.

Pros Good range of features
Cons No serious failings

Contact Rhino Software
Online www.ftpvoyager.com
Price $US39.95

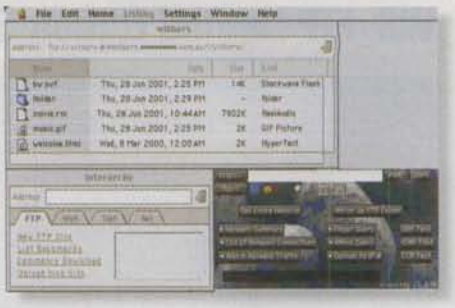
It also has automatic dialing (so if you're on a dialup connection, it can connect to the Net automatically), browser integration (it downloads all FTP links you click on) and a 'find files' feature similar to the one found in Bulletproof.

EDITOR'S CHOICE
Australian Personal Computer

CuteFTP

Identifying one FTP client as the definitive champion was exceptionally hard. All the programs *APC* looked at handle the basics very well. Most are the result of several years' worth of development, and all have unique features that make them superior in one area or another. However, CuteFTP's strong general features make it the best option for most people — but its competitors are gaining fast.

Macintosh FTP Clients



Interarchy

Interarchy is the gold standard for Mac FTP clients. For downloading files, the main advantage FTP clients have over Web browsers is speed. When *APC* evaluated Interarchy, it outpaced NetFinder and Fetch in our broadband tests.

Interarchy does a very good job of creating a mirror image of a Web site on your hard disk. When you've finished editing it, the FTP Mirror Upload command automatically uploads only those files that have been changed. Fetch and NetFinder have similar features.

All three programs use Macintosh technologies such as AppleScript, the Keychain and the Internet control panel. Interarchy also allows you to create custom interfaces (see the example in the lower right area of the screenshot). These are the equivalent of skins for MP3 players.

Interarchy has an abundance of additional functions, including ping, traceroute and Sherlock-style searching (which takes advantage of any installed Sherlock plugins). There's also a collection of services, including finger and NTP demons. The Telnet AppleScript demon allows you to log into the Mac via telnet, then enter and execute an AppleScript. This is a powerful feature for advanced users.

Contact Interarchy
Online www.interarchy.com
Price $US35

NetFinder 2.3

NetFinder claims to be the most Finder-like FTP program, and it is. Its features include familiar shortcuts (such as Command-I for Get Info) and hierarchical directory listings.Instantaneous BinHex and MacBinary encoding and decoding help conserve your disk space, and SSL support is available with an add-on module.

Contact Peter Li and Vincent Tan
Online members.ozemail.com.au/~pli/netfinder
Price $US35; $US15 for students with ID

Fetch 4.0

Fetch is the only Mac FTP client reviewed here that is produced overseas. It is also distinguished by the fact that a separate version isn't required for Mac OS X.

Fetch is a solid, full-featured FTP client with good support for Apple technologies, a variety of security schemes, direct server-to-server mirroring, and a convenient way of setting permissions. If you don't need frills, you may find this client good value.

Stephen Withers

Contact Fetch Softworks
Online fetchsoftworks.com
Price $US25 (free to educational and charitable organisations)

Linux FTP clients



wget

The best FTP client for Linux isn't necessarily an FTP client. If you're browsing FTP sites with HTTP and you know what you're looking for, wget will get you the file, no matter how unreliable the link. This handy little program is a dedicated non-interactive, re-getting file retriever that grabs any file you like using HTTP or FTP. All you have to do is pass it a URL. It's like a canine retriever — when dodgy FTP sites keep disconnecting you, it doesn't give up. It re-gets, resumes straight away and doesn't stop until the file is complete.

Moreover, it's capable of getting more than one file. One of wget's key features is its ability to follow directories and links, and grab whatever it finds there. You can use wget to mirror an entire FTP or Web site with a single command. It's even smart enough to rewrite the internal links in HTML files to point to the local copy of the referenced information on the hard drive — that is, a mirrored Web site will work from your hard drive.

This program is so good that some Linux GUI-based FTP clients are just front ends for wget.

Contact Hrovje Niksic
Online www.gnu.org/software/wget
Licence GNU Public Licence

Prozilla

If you need to download files very quickly and have bandwidth to spare, Prozilla is your tool. Designed in the image of GoZilla, it grabs files using HTTP or FTP and splits them into at least four parts. Because it streams each part simultaneously, it uses more bandwidth and cuts download times.

Like the other two programs here, Prozilla isn't a GUI-based tool; it runs from the command line. At present, the best Linux clients are those available from the command line.

Contact Prozilla
Online prozilla.delrom.ro
Licence GNU Public Licence

NcFTP

If you want to log in and browse from the command line, you can't beat NcFTP. Essentially a super-enhanced command-line FTP client, NcFTP has bookmarks, status bars, automatic login, directory name completion and caching. It's easy and quick to use and comes pre-installed with most Linux distributions.

Ashton Mills

Contact NcFTP Software
Online www.ncftp.com
Licence Freeware

Setting up your own FTP server

Setting up your home PC as an FTP server is quite easy when you understand a few of the basic principles. It's a much more reliable and efficient way to share files with friends across the Net than almost any other method. For this tutorial, *APC* chose to use Serv-U FTP (included on the cover CDs), because it's relatively easy to set up and has powerful customisation settings.

Serv-U FTP works on the principle of user-based access. As the FTP administrator, you decide what your users can and cannot see, and what privileges they have.

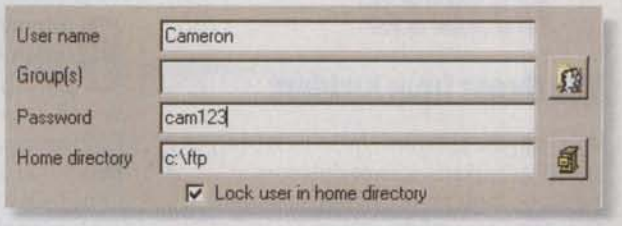
A quick word of warning: many ISPs frown on their users operating FTP servers, so check your usage policy to be sure.

Preliminary preparations

Before you begin, you need to prepare an area on your hard disk for the FTP. First of all, choose a HDD partition with at least 300M of free space. For ease of access and organisation, create a directory called 'FTP' on this partition. This is where everything you want people to be able to access will end up. Within this new directory, create another one called 'Uploads', which is where people will send and save files on to your FTP.

Installing the software

Next, install the software and click through all the default options until you get to the final step. Here, make sure 'Start Serv-U Administrator program' is ticked. Next, the FTP runs through a setup wizard — just click through using the default settings until you get to 'Your IP address'. If you are on a permanent connection such as cable and you know your IP, enter it now. If you don't know your IP, or are using a dialup modem, leave the space blank and click through until you get to 'Anonymous account'. To be on the safe side, it's a good idea to tick No here, because you don't want just anyone being able to log on to your FTP. Click to the next step, and select Yes when asked if you want to create a 'named account'.



▲ Figure 2: Creating additional users

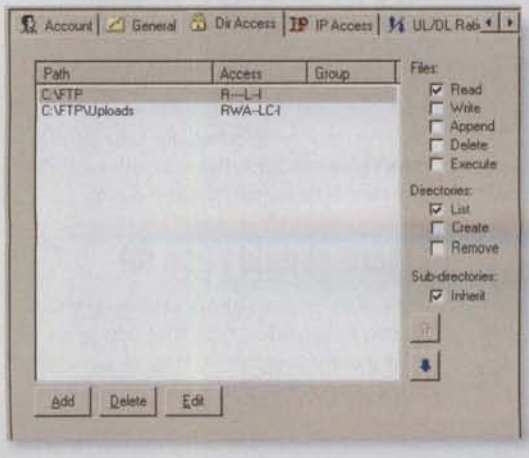
Setting up the users

Next, create your first user. The test account created here demonstrates some of the options available to you. In the 'Account login name' field put 'Test'. Select a password of your own choice. *APC* used the rather insecure 'test123'. Choose the home directory by browsing to the location of the FTP directory — in *APC*'s case this was C:\FTP. Select Yes to 'Lock user in to the home directory?' — this means that the user will not be able to browse outside the \FTP directory. If you don't want to give this user account administration privileges, select 'No privilege'. Click Finish. You will now see the Serv-U Administrator screen.

Now you can tweak this account so that the user has the correct level of access and can upload to the Uploads directory. In the Serv-U Administrator screen, click on 'Test' under the Users tab. Next, click on the 'Dir Access' tab in the right window.

First, let's change the default access 'Test' has to the FTP. At the moment, the user has been given full access to read, write and delete anything on the FTP — this isn't advisable. Click on the X:\FTP item (where X is your drive letter), and make sure that only Read, List and Inherit are selected in the boxes on the right (see figure 1). 'Read' allows users to download files, 'List' allows them to see the contents, and 'Inherit' means that every sub-directory below the one selected has the same privileges. The options selected in this instance mean that 'Test' will be able to look at and download in any directory below FTP (effectively the entire FTP site), but won't be able to change anything.

Next, click the Add button, browse to X:\FTP\Uploads, and then click Finish. In order to give the user write access (including the ability to resume, or 'append' broken uploads), and the ability to create directories, select Read, Write, Append, List, Create and then Inherit.



▲ Figure 1: Setting user privileges

Now you've created a basic FTP user account. 'Test' is able to download from the whole FTP, and to upload and create things in the Uploads directory.

To prevent users from being able to explore subdirectories, add the selected directory to the list, and un-tick all its values in the boxes on the right.

You can create additional users with more specific privileges by starting from scratch (right-click on Users and click New User). Otherwise, you can copy 'Test' and change the login details on the Account tab in the right-hand window. For example, in figure 2, the user 'Test' has been copied and the login and password have been changed. The most important thing to remember when creating new users is to make sure they have a login, password and home directory, and to decide if you want them 'locked' into their home directory.

Finally, check what IP address your FTP is running on. This can usually be found in the Local Server menu on the left. You can also click Help and Local IP Address. This gives you a list of all the IP addresses your PC has. If you're on a network with a cable modem, you'll probably have two different numbers — one is local and the other is the Internet. Take note that if you're on a dialup account, your IP address will probably change every time you reconnect, so you'll need to tell your users what the new address is each time.

Testing your setup

Next, try to connect to your server. The best way to do this is to give a friend the login details, and get them to report what they see. You can also test the account yourself, and make sure all the privileges are correct. Do this by entering the server details into your FTP client.

There are many more customisation options available, so keep exploring and testing until you have your setup the way you want it.

Daniel Gardiner

Corporate briefs

The threat from insiders

Although the potential threat to security posed by hackers receives the most publicity, most intrusions into corporate IT systems are actually caused by company insiders, according to a new survey. The study, co-sponsored by security vendor Camelot IT and corporate magazine *eWEEK*, found that 57% of companies had problems with staff gaining unauthorised access to corporate resources, and 43% suffered security breaches after failing to close down accounts after staff had left the company. "Recently publicised external hacks represent a very small portion of the constant infringements a network endures daily," Camelot CEO Yuval Baharav said. "Too often, 'authorised' user behaviour goes unchecked."

B2B firm turns to SAP

Commerce One, one of the most prominent global B2B developers, has not been immune from the general decrease in interest in the B2B sector in recent months. However, the company has received a lifeline from a somewhat unexpected source: German ERP giant SAP. In late June, SAP announced that it was injecting $US225 million into the company, giving it a total ownership stake of 20%. The move comes despite SAP's own problems in the market; earlier this year, it shut down its local MySAP.com site, a joint venture with Telstra. The investment came as Commerce One warned of lower than expected quarterly revenues.

Hard(ware) times for VA Linux

Linux companies also continue to face challenging financial times (see *APC* August, page 117). VA Linux, the first Linux business to mount an IPO, has withdrawn from producing Linux-specific hardware to concentrate on software development. The change of focus will reduce the company's costs, but will also place it in more direct competition with other developers such as Red Hat and Caldera. While a handful of Linux hardware developers remain, most Linux users simply install the OS on systems from Windows PC builders.

Rented apps save headaches

Customer uncertainty about the application service provider (ASP) model of rentable applications may have slowed its growth, but staffing consultancy GME International has realised huge benefits by building its IT infrastructure around Com Tech Central's (CTC's) ASP services.

A management buy-out several years ago paved the way for a new business structure, so GME implemented a total greenfields network for its reorganised business.

The directors were aware of the problems inherent in thick client architectures, particularly the intensive management burden. Working with CTC, the company carefully mapped out its business requirements and decided that they could be effectively met using ASP-delivered applications.

GME set up 2Mbps frame relay links from its two offices straight into CTC's data centre, where six dedicated servers deliver applications including Microsoft Office 2000, SQL Server and Great Plains Dynamics financials, Peoplesoft's Vantive CRM, and other purpose-built tools. The employees access the applications using Wyse Technology's Winterm dedicated thin client terminals, linked to about six local printers.

GME's three-year ASP contract costs $360 per month for each of 29 Sydney users and $550 per month for each of six Melbourne users, including all application and telecommunications costs. For $164,880 per year, GME has a fully functional IT environment that requires no administration on its part. An inhouse environment would have incurred capital costs, individual application licensing fees, two $100,000 IT manager salaries, and other expenses.



▲ Bruce Ebert with Neil Richardson and Jonathon Klug of Com Tech Central.

"Traditionally, you build an IT infrastructure, your business grows to fill that and you rebuild your infrastructure," GME director Bruce Ebert said. "You have to keep qualified IT specialists to maintain it. [With ASP], everything is scalable, and you don't need onsite technical support. This means I don't worry about the infrastructure; I just focus on expanding the business."

David Braue

This month's buzzword: infomediary



Why do we need this word?

Attempting to distinguish between the many different kinds of online business models routinely dumped in the category of ecommerce has led to an ongoing requirement for new terms for specific sub-genres. The emergence of the term 'infomediary' (a combination of the words 'information' and 'intermediary') is a classic example of a word that's been produced to fill such a void.

What does it mean?

The concept of the infomediary is generally considered to have been coined by John Hagel and Marc Singer in their book *Net Worth*, a study of how companies established as infomediaries could rake in big bucks. The infomediary provides impartial advice and information to a virtual community, enabling members of that community to make better decisions.

An infomediary could exist in any virtual community, but the term is most often applied to shopping advisory services, which collect information on a product and help consumers make a purchasing decision. There isn't much money in just offering advice, so infomediaries often take a cut, by referral fees or as a percentage of transactions. Whether their advice remains impartial in these circumstances is debatable.

Net Worth was published in 1999, and it has become clearer since then that moving into the infomediary field may not mean guaranteed riches. Nonetheless, the term is still routinely bandied about.

Where should I use it?

During discussions about changing your hardware provider, note that "using an infomediary could really help us cut costs in the research and procurement phases". Good luck finding one.

Nuts and faults

Fault and performance management is not the sexiest aspect of IT deployment. Tracking down faults within a network or an application, and using historical data to predict when and where problems are likely to occur, ranks somewhere near manually filing paper documents when it comes to arousing the passion of your typical IS manager. However, maintaining uptime, always a crucial task, has taken on increased importance as online business has taken hold and 24-hour availability becomes a necessity, not a luxury.



Illustration by Warren Taylor

"IT investment without managing performance is a waste of time," Jack Blaeser, CEO of network management software vendor Concord, said during a recent visit to Australia. Concord is one of several companies that are competing to provide tools designed to simplify the process of maintaining uptime and predicting faults.

Concord's original software merely tracked uptime across networks, but the company soon realised that to stay competitive, it would need to have a broader focus. "We had to change the brand to be more than networking, because the market was shifting," Blaeser said. As a result, the company's eHealth suite now provides both real time and historical information on availability for networks, applications and Web sites.

Those capabilities have been added largely by acquisition; in October, 1999, Concord purchased Empire Technology, which specialised in application management, and in February, 2000, it bought First Sense Software, a developer of application performance analysis tools. The ultimate goal? "The network should be built so you have self-healing servers," Blaeser said. Of course, that problem can't be solved purely with software — additional hardware will often be needed to eliminate single points of failure — but packages such as eHealth can play a critical role in identifying where and how often problems occur.



▲ CEO of network management software vendor Concord, Jack Blaeser.

Traditional network management identifies faults at the equipment level, but more sophisticated software focuses instead on the business processes that rely on the equipment. Thus, rather than specifying that a given router has collapsed, the software will track whether a specific business function — whether that's providing access to cash with an ATM or sending Internet email — is working, and implement either alerts or predetermined fixes when something goes wrong.

"It has become a business-oriented focus," Blaeser said. "Businesses don't want to know about the plumbing. We're trying to automate technology management so they can run the business."

However, Blaeser cautions against becoming too focused merely on cost and availability metrics. "Enterprises have got to look at their IT organisation not as a cost, but as a competitive weapon," he said.

In order to convince cash-strapped CEOs, Concord also offers a free tool to assess the return on investment (ROI) from installing performance management software. The eROI suite calculates how much staff time is currently spent managing faults, and weighs that against the cost of installing the software. (The eROI service can be found at www.concord.com/forms/createform.asp?formnum=238.)

What's it worth?

Blaeser estimates the total market for fault detection and management at between $US5 and $US15 billion, but cautions that the market has yet to mature to the point where it can really be recognised. "It's a big market, and lots of people have little pieces of it," he said, citing BMC, Computer Associates, Hewlett-Packard and Tivoli as the other major players in the sector. "In today's market, no-one owns the space."

Trying to find companies who can handle all those diverse technologies is also a problem. "It's hard to find a partner that can sell the entire suite," he commented.

Like many software companies, Concord also foresees a large revenue base from service providers who will resell their software as part of a network service bundle, providing both the basic infrastructure as well as monitoring tools. While the ASP market as a whole appears moribund, companies are already used to farming out at least some of their network requirements.

Currently, there are around 400 service providers in telecommunications and other fields offering fault management and prediction using the software, Blaeser said. In the Asia-Pacific market, the company has 150 customers, and recently signed a $3 million deal with COMindico to offer fault detection within its wholesale IP services. Other local customers include CUB, Telstra and the Australian Stock Exchange.

Angus Kidman

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Patch Panel

The Patch Panel section on CD 1 of *APC*'s cover CD pack includes the latest patches and updates for a wide range of operating systems and applications.

Is it too easy to break Windows?

A recent spate of security alerts has highlighted major security problems in Windows NT and its successors, and now insurance companies are arguing that businesses that use the software represent a major security risk. ***Angus Kidman*** *investigates.*

To many people, the idea of insuring their computer systems against hacker attacks might seem a little bizarre. But what if the insurer starts charging higher rates to people who use the world's most popular software?

This possibility is not just speculation. In April, Wurzler, one of the largest providers of specialist insurance against hacking and other unwanted network intrusions, began charging an extra premium to customers who use Windows NT. The reasoning behind this is that so many potential security holes have been identified in Microsoft's networking operating system that the insurer felt it had no choice but to set a rate that would reflect that fact.

It is likely that other companies will follow suit. A research note by Gartner Group predicted that 75% of security insurance providers will be charging an NT surcharge by 2002, describing security weaknesses in Microsoft products as "widely recognised".

"Hacker insurance products are very new, so insurance underwriters have little actuarial data and must base rates on product integrity and implementation of proven security measures," the note added. "Wurzler's decision to apply an NT surcharge is a prudent move designed to protect the future viability of this market segment."

The conclusion was equally blunt: "Gartner advises enterprises using NT for Internet operations to consider purchasing insurance against security failures, and to be prepared to pay a surcharge for such insurance."

Patch as patch can

When even insurance companies believe that Windows is markedly more unreliable than its competitors, it seems clear that something is going quite wrong. Gartner estimates that only 25% of users will actually insure against an unwanted intrusion, but if it does occur, the costs can be high.

An annual survey conducted by the Computer Security Institute in conjunction with the FBI demonstrates both the scope and cost of the problem. Of the 538 companies surveyed, 85% had detected computer security breaches, and 64% had suffered a financial loss as a result. Those who were able to quantify that loss measured it at an average of $US200,000, and the most common problems were financial fraud and the loss of proprietary information. The majority of attacks (around 70%) came from the Internet, rather than via internal access — up from 59% in the previous year. Given those figures, insurance seems a sensible option.



Illustration by Warren Taylor

Microsoft can draw some comfort from the undoubted popularity of its networking products — according to IDC, it attracted 41% of new licence purchases for its server products in 2000. Clearly, Windows' security problems haven't yet affected its sales.

However, that popularity is also a double-edged sword; because NT systems are so widely deployed, the incentive to find potential security holes is increased, and the potential number of victims of an attack is also much higher. An added difficulty is posed by Microsoft's continuing efforts to tightly integrate the various components of its back-end solutions. While that can make for easier administration, it enhances the potential impact of a security flaw in any one component product.

Going wrong

Fixing the problems isn't always easy. In one recent example, an attempt to patch up a security hole in Exchange, Microsoft's email and collaboration package, actually made it worse. In June, Microsoft issued a patch for a security flaw it had identified in Exchange through its Windows Update service. The flaw made it possible for malicious attachments in mail that was being read through a Web browser to delete mail data.

Microsoft was forced to withdraw the first patch after administrators complained that the fix caused many mail servers to hang completely. Three days later, it issued an updated patch, but this also caused instability for many users. Only on the third attempt, a week after the original release, did the patch finally work.

Such problems can make users reluctant to adopt the latest patches, which creates a vicious circle. Without applying the patches, servers remain vulnerable, but when they are applied, new problems can appear.

The Exchange patch was an embarrassing episode, but other flaws have the potential to affect even larger numbers of users. In June, Microsoft was forced to develop a patch for its Web server software after security consultant eEye Digital Security identified a flaw that could have affected almost all users of IIS, Windows' built-in Web server. The long-running Netcraft survey estimates that almost 6 million sites use IIS, making it the second most popular choice after Apache.

A flaw in the ISAPI indexing extension included in IIS (which was installed by default) meant that it was possible for a skilled Web programmer to create a

'buffer overrun' and execute malicious code. (Buffer overruns are one of the more common vulnerabilities found in Web servers, and occur when more data is sent to the server than it expects. Depending on how the server is configured to handle the unwanted data, it may end up being effectively treated as executable code, giving it the potential to be used for unauthorised activities, although this normally requires a highly detailed knowledge of how the software works.)

"Attackers that leverage the vulnerability can, from a remote location, gain full system-level access to any server that is running a default installation of Windows NT 4.0, Windows 2000 or Windows XP and using Microsoft's IIS Web server software," according to eEye's own discussion of the topic. "With system-level access, an attacker can perform any desired action, including installing and running programs, manipulating Web server databases, adding, changing or deleting files and Web pages, and more." Microsoft was briefer, but blunter: "Clearly, this is a serious vulnerability, and Microsoft urges all customers to take action immediately," according to the company's security bulletin on the topic.

Web site vulnerabilities are particularly attractive to hackers, since by definition Web servers must offer a degree of public access. In May, attrition.org, which had been tracking and running an archive of Web site defacement attacks, announced that it was stopping the service, because it could no longer keep up with the rate of attacks. In its final months of operation, it was often receiving news of more than 100 attacks a day. If each of those cost just a quarter of the average $US200,000 reported in the CSI survey, the economic impact would still be profound.

Keeping secrets

The IIS vulnerability also highlighted one of the other problems which both Microsoft and its customers face. Once a security problem has been identified — something which more often than not happens outside the company — how quickly should that information be disseminated? Should all potentially affected parties be notified immediately (through a security newsgroup or email bulletin), or should the first port of call be the company that originally developed the software?

Microsoft's own attitude is clear: it wants to be told about security problems as soon as possible, but it doesn't want to publicise them until after it has had a chance to develop a patch that might recognise the problem. In January 2000, it updated its acknowledgement policy for security flaws to reflect that view.

"When we find a vulnerability, we develop a patch as quickly as possible and broadly disseminate information about the vulnerability, the risk it poses, and what customers can do to protect themselves against it," a note on the company's security site explained. "However, to do this we need the help of the people who discover security vulnerabilities. No vendor can develop security patches overnight. Microsoft products run on thousands of different manufacturers' hardware, in millions of different configurations, and in conjunction with countless other applications. Our patches must operate correctly on every single machine. This is a significant engineering challenge under any conditions, but it is even more difficult when details of a vulnerability have been made public before a patch can be developed.

"There has traditionally been an unwritten rule among security professionals that the discoverer of a security vulnerability has an obligation to give the vendor an opportunity to correct the vulnerability before publicly disclosing it. This serves everyone's best interests, by ensuring that customers receive comprehensive, high-quality patches for security vulnerabilities but are not exposed to malicious users while the patch is being developed. Once customers are protected, public discussion of the vulnerability is entirely in order, and helps the industry at large to improve its products." In other words, if you widely publicise a security flaw and only tell Microsoft about it afterwards, the company is much less likely to put a nice thank-you note in its security bulletin on the subject.

While many security professionals are sympathetic to that viewpoint, the continued appearance of problems in Windows means that their patience is wearing thin. "Some people might wonder why this advisory does not contain the typical eEye humor like most of our other advisories," eEye consultants wrote in their advisory on the recent IIS problem. "Basically, the reason is that this is our fourth remote system-level IIS vulnerability and well . . . we've run out of jokes."

In the meantime, the large group of companies who are sticking with NT need to plan carefully, stay alert and ensure that sensible, proactive security precautions are being taken. "Responsible security practices begin with business planning and carry through to the technology purchasing, implementation and improvement stages," Gartner research director Roberta Witty said recently. "After all, there's no sense investing in locks if you've built your house out of paper."

Problematic in theory

Microsoft's security alert site at www.microsoft.com/technet/security may at first seem to suggest that every product in the company's range is riddled with bugs. A recent listing included problems with Word documents changing macro security settings, buffer overruns in FrontPage extensions and problems with caching in SQL, along with the other examples discussed in this article.

However, it's important to recognise that the majority of these security flaws have not been actively exploited. Many are identified as potential problems by security consultants or IS managers, and patches deployed before the vulnerabilities have become widely known. Others can only occur under highly specific circumstances.

If servers are regularly updated with the latest patches, and managers follow sensible security precautions, the likelihood of their suffering from most of the problems is minimal. This is, of course, of little comfort to those organisations that do find themselves caught out.



Building the agile ebusiness

Creating a versatile system for electronic business requires careful planning of basic infrastructure.

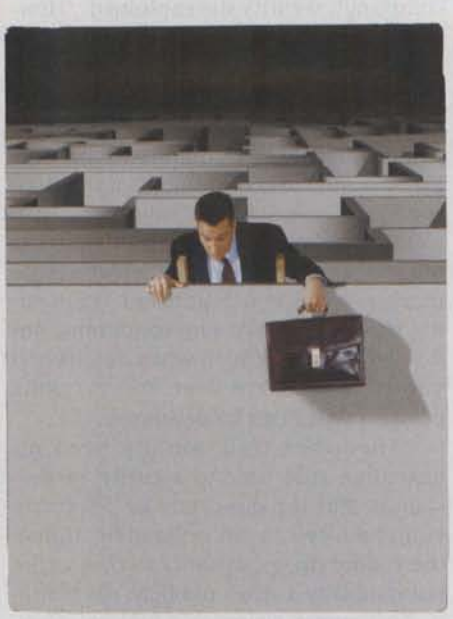
While the notion of ebusiness may be a little out of favour at the moment, companies are still aiming to develop effective electronic business infrastructures. But just what elements should comprise such a system?

An effective ebusiness needs infrastructure that offers agility, scalability and availability, according to Kevin McIsaac, program director for server infrastructure strategies at industry analyst Meta Group.

In this context, 'agility' means being able to deploy one project rapidly and proceed directly to the next. According to McIsaac, an 'n-tier architecture' — which comprises at least a back-end database, an application server and a Web (or other presentation layer) server — has characteristics that can provide this agility for transactional systems such as ecommerce. In particular, it works efficiently over the Internet and there is either no need to deliver client software at all (if the client is a browser that comes as standard with a PC, WAP phone or other mobile device) or it is a lightweight program that can be distributed to client devices using the network.

Furthermore, an n-tier architecture locates the business rules in the application server, which makes them independent of the back-end database and means that rules can be changed once and the effect will flow through all presentation modes. Instead of making separate changes to the Web and WAP versions of the software, you just update a rule in the application server. Then, if you subsequently add natural language speech recognition (NLSR) to enable transactions over a normal phone, all the rules and back-end processing are already in place. All you need to add to finish the system is the NLSR presentation server.

Another key architecture for ecommerce is the stateless farm. The term 'farm' refers to the idea of using multiple commodity servers (typically Windows NT running on regular PC hardware) rather than a small number of high-end servers from companies such as Sun. The rationale is that this allows fast, easy and cheap expansion as required. You can literally go out and buy the hardware off the



shelf, plug it in and load the appropriate software in a couple of hours.

While the availability of each individual server might be only 95%, compared with the 99.999% ('five nines') sometimes bandied about as a benchmark, having multiple servers does give high overall availability.

This is where the 'stateless' concept comes in. The idea is that the user's state (for example, the items held in their shopping trolley) is not held by the Web (or other presentation layer) server, but in the data layer. Putting a load-balancing router (which sends each Web request to the least busy server) between the Internet connection and the Web server farm means that it doesn't matter if a Web server fails during a transaction or gets overloaded; as soon as a user gets tired of waiting for the server to respond and hits the Refresh button, the router will send that request to the least busy available server. This router is also a key to being able to increase the size of the farm very quickly. This approach to scaling is sometimes called 'scaling out', as opposed to 'scaling up' to ever-larger servers.



▲ Kevin McIsaac, program director for server infrasrtucture strategies at Meta Group.

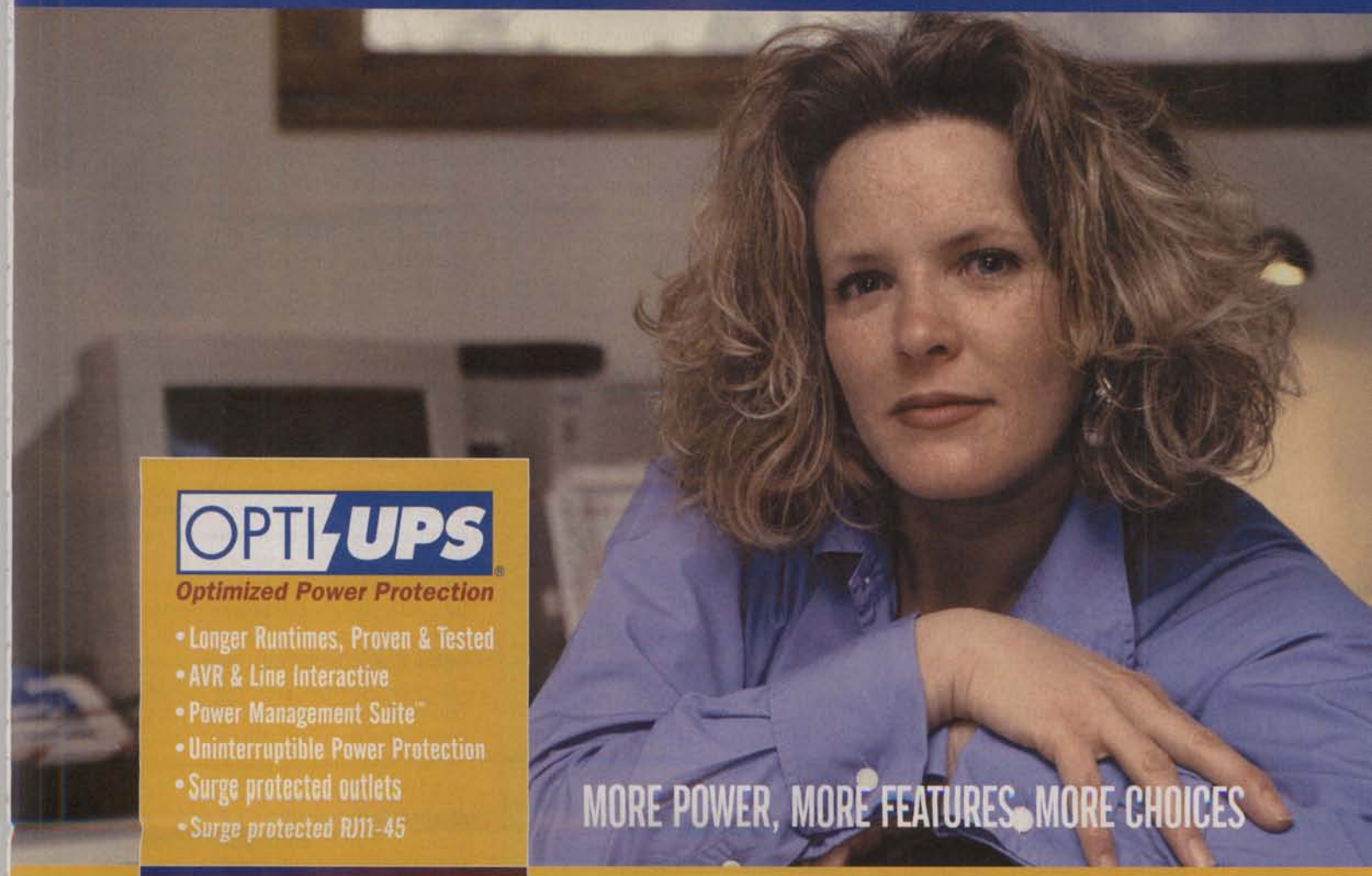
The farm concept is currently being extended to allow the use of multiple application servers to increase the reliability of commodity hardware and to allow similar scalability. "The application server allows ordinary programmers to build extraordinary applications," McIsaac said, because the use of the software component model means that application developers who understand business processes can create functional components while the application server takes care of the scalability. This is in contrast to traditional transaction processing monitors, which require applications to be coded with attention to the monitor's internal functioning.

McIsaac warned that database farms are not currently a reality, so a typical configuration is a box which contains four or eight Intel processors and runs Windows NT or a large RISC/Unix system. The NT servers are likely to displace Unix in the next couple of years, he predicted. Either way, these servers can be deployed in pairs to allow failover (automatic load shifting to the remaining server in the event that one fails).

Database vendors have 'locked in' their customers, partly through supplying proprietary development tools, and partly by storing application logic (such as business rules) in the database using a proprietary language. In the n-tier architecture, the business logic is stored in the application server, which makes it much easier to change from one database management system to another. McIsaac pointed out that IBM's DB2 database is between 30% and 70% cheaper than Oracle's product, yet it performs similar functions. So, in addition to allowing the use of commodity hardware, the n-tier architecture tends to reduce costs even further by effectively turning database systems into commodity items.

Stephen Withers

BLACKOUT SHATTERS WENDY'S DREAM



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APC/2806ATD

Contract sport

Australians have been slow to embrace contract management despite a host of business-to-business benefits, ***David Braue*** *reports.*

Business has rested on the foundation of legal jargon for centuries. Yet despite the improvements in efficiency brought about by the migration of many back-end business processes online, most companies still manage their legal contracts using antiquated, paper-based methods that are more than due for updating.

Although it may not receive explicit recognition in the budgets of most companies, the burden of managing contracts by hand can be immense. According to the US National Association of Purchasing Managers (NAPM), the average Fortune 1000 company has relationships with 20,000 to 40,000 individual vendors — an increase of 20% in the last five years.

These contracts manage strategic partnerships, customer support, project implementations, service level agreements, equipment purchasing, maintenance, and every other aspect of a business that involves an agreement between two or more people. Not surprisingly, the cost of managing so many contracts is immense: the typical company spends 0.5% of its revenue managing compliance with, and updating of, those documents. One employee is needed for each $US5 million worth of purchasing contracts.

The enduring importance of paper contracts has somewhat impeded efforts to push the business community into adopting online purchasing, partner collaboration and the other elements of B2B ecommerce. While operators of procurement portals, for example, like to tout the benefits that their online portals will bring, most have no way of helping customers to address the 78% of B2B online purchases that the NAPM says are still managed according to contracts negotiated offline.

Online systems have proved to be adept at improving the efficiency of myriad business processes in the past, but contract management remains stubbornly antiquated. Filing cabinets full of paper documents are still the main method of tracking contracts, which are often written, filed, and only referred to again in cases where problems arise. Needless to say, this approach is riddled with potential problems.

Searching for a better way

Attempts to improve this process are nothing new, having been led by document management companies who see their technology as a natural complement to the process of managing contracts. Scanning, sorting, indexing and electronically storing images of documents for access via company intranets at least solves the problem of having to track vast quantities of paper around the company.

They do improve access to images of paper documents, but such solutions are only one aspect of a widespread effort to ease the burden of contract management. Recently, a number of independent vendors



have offered a better solution in the form of contract automation systems that help companies adapt online business processes to the legal requirements that guide them.

Over the past year, US software vendors have begun pushing such solutions into the market, proposing them as a means to reduce the cost and complexity of managing contracts. The systems could slash that cost to 0.1% to 0.25% of revenue, according to figures from business analyst firm Goldman Sachs, which last year released what is considered the definitive study of the emerging contract automation market.

"There's been so much pressure to shorten product lifecycles because of global competition," says Poonam Dhawan, director of market development with emarketplace vendor Exterprise, which positioned contract management as a core component of its prefabricated emarketplace offering.

"While companies have been able to shorten that cycle, sourcing still remains a bottleneck: it's still typically taking 15 to 16 weeks to find a supplier and negotiate contracts with that supplier. We enable companies to reuse a lot of the work that has been done previously, and because of the intelligence integrated into the platform we're able to gather a lot of intelligence along the way. We can provide a unified [view] of what is the global trend, so that companies have a lot more leverage in negotiations with suppliers."

As well as reducing administration costs and recording company expenditure more accurately, contract automation systems make the contracts that determine how companies operate more powerful. By providing a range of options for modelling established business processes, they can be integrated into a company's workflow to check each employee purchase automatically for compliance with existing contracts. This can eliminate potential penalties for non-conformance and can help companies ensure they're meeting their commitments.

Say, for example, that a company has committed to buying at least 10,000 pallets of wheat from supplier A per year, but different business units have negotiated backup contracts with overseas suppliers B and C that include minimum annual purchase commitments and discounts as volume increases. In a manually administered company, different purchasing agents may well be unaware of the company's progress towards meeting its quota requirements. By the end of the year, this could easily lead to non-compliance costs.

Using contract automation, each purchase would be checked against the terms of every relevant contract, perhaps recommending B or C if the company hasn't made sufficient progress towards meeting its requirements. By interacting with the company's back-end financial systems, the contract management system could also take discounts automatically, according to the

contract's terms, based on the company's purchased volume over the year. Such discounts may be missed in a manual system.

"It gives people control where they did not have control before," explains Martha Olsen, interim vice-president of marketing with contract management vendor Provato. "What happens before and after the [ecommerce] transaction is really unaddressed by most ecommerce solutions. So by handling the terms, conditions, business policies, regulatory aspects, and anything in terms of the rules of engagement that affects a future business transaction, we can reduce revenue leakage that's costing billions of dollars per year. The sense [among customers] is that we're reducing inaccuracies and improving compliance."

Finding its feet

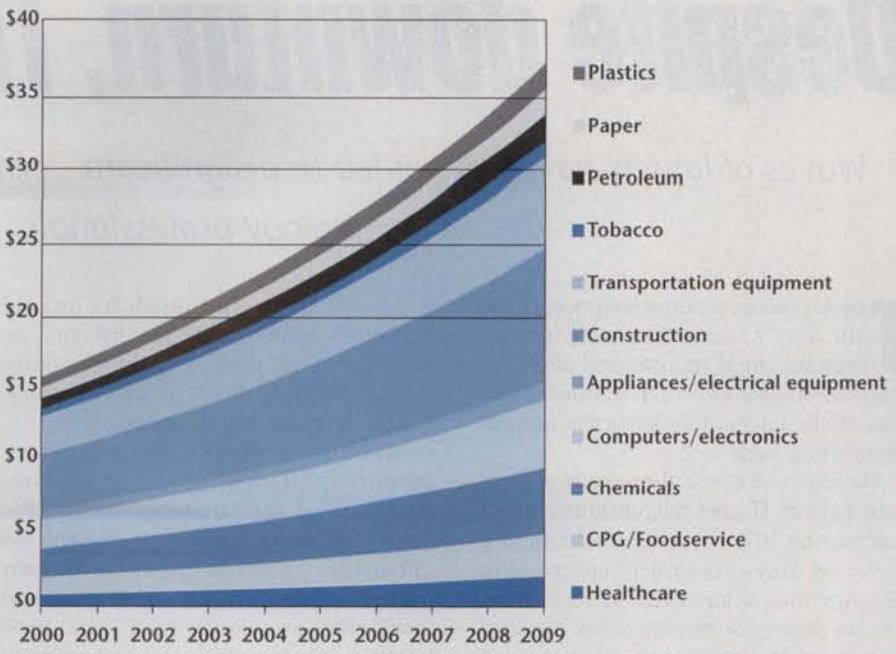
Echoing the enthusiasm of vendors for contract automation solutions, the Goldman Sachs analysis predicted that the total market for the systems would grow to be worth $US3.1 billion globally by 2005, which the company suggested would allow the sector to qualify as a standalone industry.

The likelihood of it reaching that point, however, has been substantially reduced by signs of industry consolidation. Earlier in the year, leading contract management vendor diCarta joined forces with eprocurement giant Ariba, with a future takeover likely. In April, Commerce One snapped up Exterprise, whose expertise in contract management and other emarketplace services will complement Commerce One's own ecommerce infrastructure capabilities.

Other acquisitions are likely to follow as contract automation becomes entrenched in the stable of enterprise software vendors. It's already found in many such solutions, albeit in a primitive form: for example, Nortel's Clarify CRM division has positioned document-based contract management as an addition to its core call centre and customer support systems.

"There's no point in having very generic contracts if they're not tied to a [unique] service level agreement," said Mitch Radomir, ebusiness solutions and marketing head of Nortel Networks' ebusiness solutions group. "Contract managers tie into our full CRM suite, doing workflow and business rules so the actual contract manager can tie in and ensure action items are signed properly. Certain events occurring with customers can be triggered based on the rules you've assigned for a contract, and the system can handle escalation that needs to happen if certain things have gone overtime."

JD Edwards, Siebel, Oracle, SAP and i2 Technologies all incorporate contract management into their solutions, although many are still at the basic document management stage. However, as customers awaken to its possibilities, the companies are sure to partner with or acquire small niche players to gain ground in this area.



Source: Goldman Sachs

▲ Market size (in $billions) for contract management software in varying industries (assuming 100% take-up).

Contract management has long been entrenched in niche market applications: energy wholesale software supplier Enermetrix, for example, has built contract automation capabilities into its BuyerMetrix system. Similar origins influence many other providers: diCarta grew out of document management, for example, and market giant i-Many originally helped manage complex healthcare contracts.

As they work to broaden their solutions, such companies face off against new players such as Aurigin and Complient as well as companies offering Web-based contract management services as outsourced applications, such as Webango and yet2.com.

Exchanges drive the way

Market consolidation over the next few years will determine which approach to contract management solutions is most successful as well as which vendors' approaches appeal most to customers.

"There's probably a long way to go in a lot of these areas," says Jill Feblowitz, utilities practice research director with analysis firm AMR Research, who believes incorporation of contract management into industry exchanges will be a major driver for the sector's growth.

In the energy industry, for example, "I mean not only the ability to track contracts initiated as a result of trades, but also to go a little bit further and, in the natural gas business, be able to hook in nominations and transportation. There's a certain amount of frustration with companies that don't have [compliance monitoring] in their enterprises. So it will be the next wave, as exchanges evolve: providing more and more of these services to buyers and sellers will allow them to integrate [stickiness] into their different operations. That's going to keep people coming back to their marketplaces."

Contract management solutions are catching on in the US, but they have yet to generate anywhere near the same amount of interest in Australia. "We're looking at it, but it's not yet near term, because there are other things we're looking at that our customers seem to be striving for initially," said Noel Hamill, ebusiness general manager with Optus, which aims its CWO MarketSite procurement venture at Australian SMEs. "Iteration on the legals tends to be offline."

Other providers see a growing, albeit small, role for the technology as Australian buyers become more aware of the technology and its benefits. "What you're trying to combat here is maverick buying," said Peer Nielsen, CEO of local emarketplace provider Vertical Markets, which offers a form of contract modelling as part of its vLifeScience, vElectrical, and vGovt portals.

"People buy things willy-nilly that aren't necessarily sanctioned by the company they work for. There's a lot of this maverick buying going on. But buyers and sellers have to agree on these price structures, and [contract management] ensures that whatever they buy, they buy it at optimum terms and conditions that have already been negotiated. Still, I think we're talking about a scale in Australia that's much, much less than it is in the US."

Despite downturn, IT still pays

Waves of layoffs have not yet led to a significant decrease in the salaries paid to technology professionals.

The days when programmers were literally able to name their price may be over, but the IT industry still offers the best year-on-year growth in salaries of any area of employment in Australia, according to a new survey.

During the last year, the salaries of more than 15% of IT and telecommunications staff rose by 10% or more, according to a survey by Hays Personnel Services, and 26% saw their salaries rise by more than 6%. The survey covered two areas: expectations of salary rises, based on a survey of 900 of Hays' Australian clients; and salary ranges, based on jobs advertised by the group in the preceding 12 months.



According to Nigel Heap, managing director of Hays, this year's biggest overall salary growth was in IT, telecommunications and professional services, and a similar pattern is expected next year.

"In the IT industry, obviously there's a lot of doom and gloom about, but that hasn't influenced the employment market too much," Heap told *APC*. "Salaries are still buoyant."

Driving that trend is an ongoing demand for IT workers, with 33% of companies saying that their biggest difficulty is in recruiting new IT staff. Heap doesn't foresee that situation changing dramatically in the near future, but competition for top-level positions is getting a little tighter.

"There are more candidates around looking for work than 12 months ago," he said. "However, there is not a significant increase in the quality of people — perhaps a slight increase, nothing more."

Problems in the dot com field, which have meant that many companies have either slashed staff numbers to a bare minimum or collapsed altogether, haven't yet affected IT staff too greatly or forced down wages, Heap said. "I don't think it has had much effect on salaries. People who have lost those jobs have found new jobs reasonably easy to come by." Notably, salaries for backroom roles such as programmers and database administrators remain higher than for many Web maintenance and development roles.

One ongoing trend has been a move away from relying on contractors, towards more permanent roles. While perceptions of market uncertainty may be driving contractors to long-term positions, Heap thinks that the change has been caused by the desire of employers to cut costs. "Contractors were earning significantly more money than those in a permanent position," he said.

That hasn't necessarily cut the overall number of jobs on offer; 54% of companies anticipate increasing their permanent IT staff in the next year. The roles which have tended to disappear have been specialised project roles such as Y2K, GST or Euro conversion, but many staff from these areas have been shifted to more general positions.

The survey identifies typical salaries paid for a range of IT disciplines in six capital cities. While there are some notable differences — for example, a Unix systems administrator can earn $85,000 a year in Sydney but is more likely to get $45,000 a year in Adelaide — in general, salaries are quite constant between states.

"The cost of living in Sydney is more expensive, mainly because of property costs, and that is always going to be reflected in salaries," Heap said. However, IT doesn't reflect that variation as much as some other fields. "The difference in IT is less than in accounting and finance, for instance," he added. The accompanying chart shows typical salaries in different cities for some of the fields covered by the survey.

In specialised areas, demand remains strong, and many smaller companies who can't afford inhouse training are forced to pay a salary premium to gain staff with relevant experience. This is less common in larger companies, which are more likely to implement training for inhouse experts in order to keep their staff up to date — a strategy which can save money in the long run. Heap worries that a decrease in training expenditure as a result of tighter economic conditions may lead to a shortage of expertise in a few years time, although empirical evidence for this won't exist for some years.

Angus Kidman

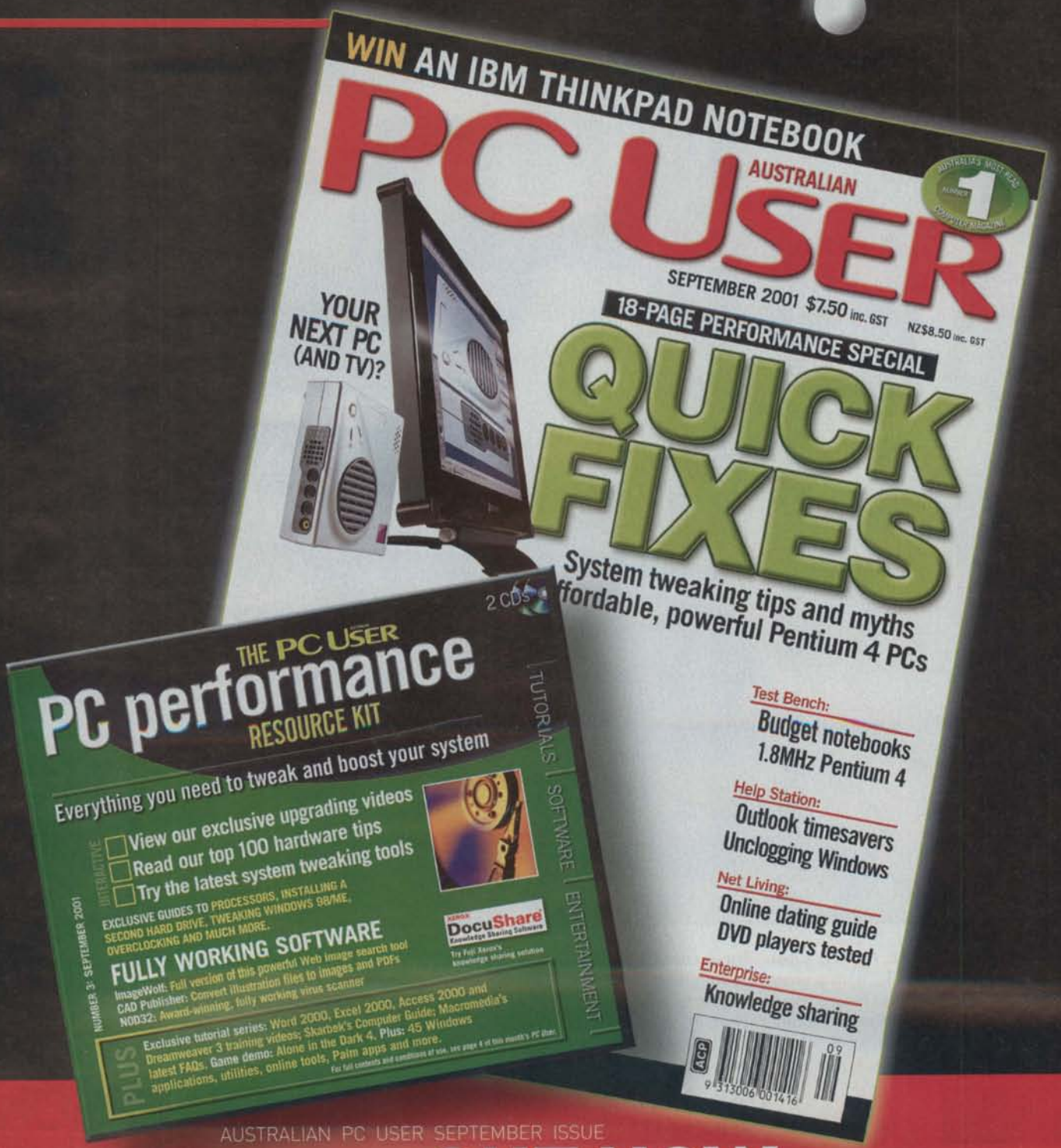
Typical salaries for IT positions

Position	Location	Salary
Help desk support	Melbourne	$40,000
PC support	Perth	$40,000
Field service engineer	Adelaide	$45,000
Hardware tester	Perth	$50,000
Software tester	Brisbane	$60,000
Voice data technicians	Sydney	$60,000
Trainer	Canberra	$60,000
Network designers	Brisbane	$70,000
Software		
Mainframe operators	Perth	$43,000
Database administrator	Melbourne	$70,000
SAP configuration	Brisbane	$80,000
Unix system administrator	Sydney	$85,000
Oracle financials	Canberra	$90,000
Web development		
Web designer	Adelaide	$45,000
Web developer	Brisbane	$65,000
Web site manager	Sydney	$90,000
Programmers		
Access	Perth	$50,000
Visual basic	Canberra	$60,000
Java	Brisbane	$70,000
Notes	Melbourne	$75,000
Delphi	Sydney	$75,000
Management		
MIS manager	Perth	$95,000
IT director	Melbourne	$150,000
Chief information officer	Sydney	$160,000

Includes only cash component of salary.

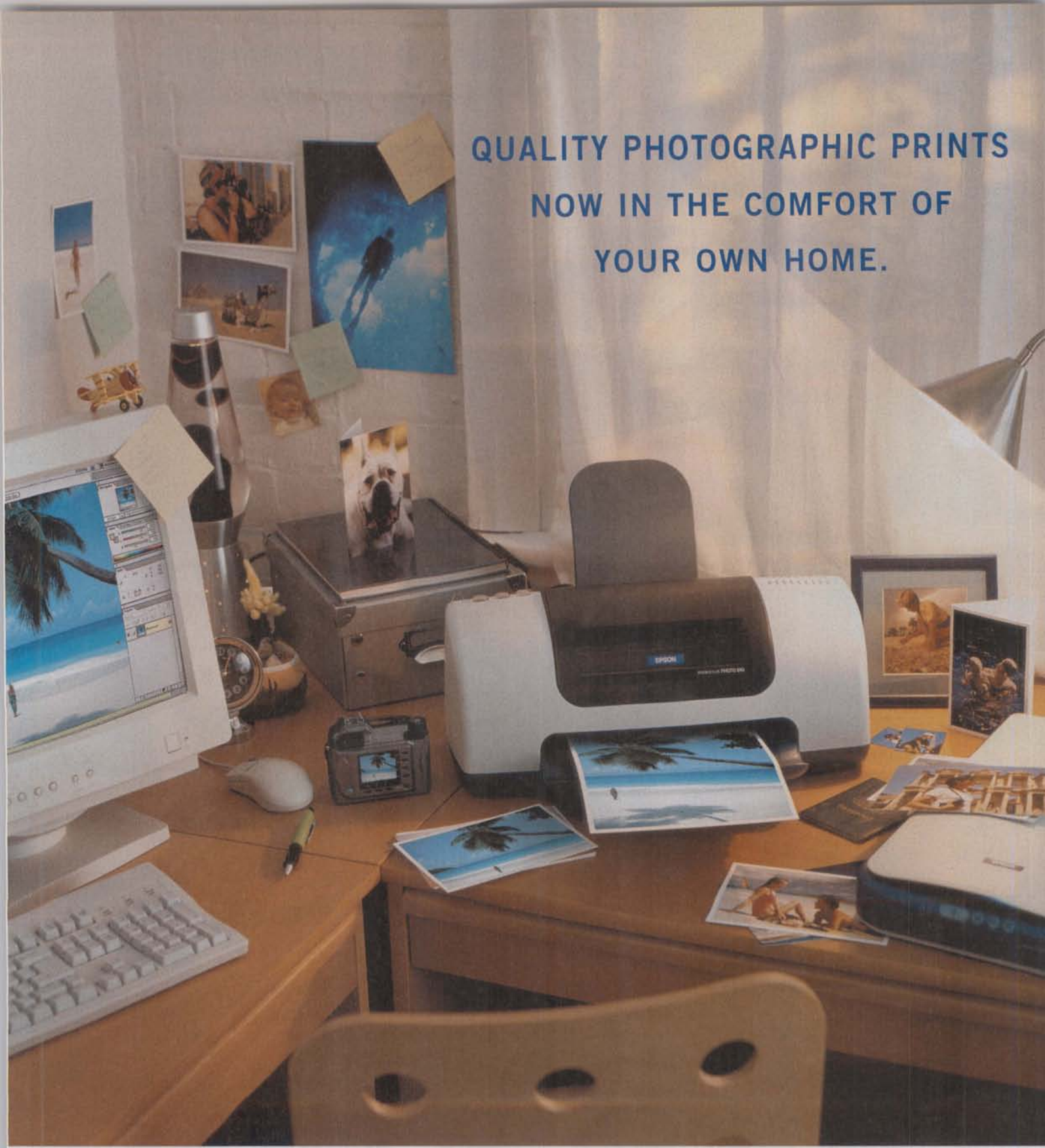
Source: Hays Personnel Services

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Zip it good

In this month's Mac OS column, Stephen Withers points out that the Mac operating system has occasionally borrowed ideas from Windows. Clearly, the popular perception that Windows is just a second-rate copy of the Apple-developed interface is not quite accurate. Nonetheless, there's no doubt that Windows has derived much of its look and feel from the Mac.



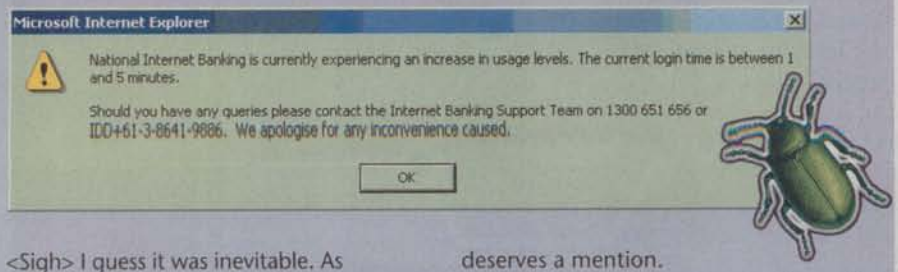
Like Windows developers, Windows users can benefit from programming ideas originally intended for the Mac. For instance, most Windows users use WinZip for dealing with ZIP files. WinZip is an efficient piece of software, but it's not free; it's shareware. Windows users who are unwilling to pay for WinZip and are not comfortable about using an unregistered version may like to try StuffIt Expander.

StuffIt is the dominant archive utility for Macs, but it is also available for Windows (betas are currently available for Solaris and Linux). Not only is the product free, it has the advantage of being able to handle the SIT format often used by Macs. You can download it at www.stuffit.com.

If, for some reason, you have an anti-Mac bias so strong that you can't conceive of using a product that was originally developed with Mac users in mind, then you might want to consider taking a long, hard look at yourself. If that doesn't work, you could hunt around for other free Windows-based archive utilities. Most archiving products on the market are shareware, but other freeware options are available, including PowerArchiver, ArjFolder and ZipCentral.

The Net-driven proliferation of freeware in the past few years is a welcome development, but it's worth remembering that shareware and freeware are not the same thing. If you find yourself regularly using a piece of shareware — downloaded from the Web or taken from *APC*'s monthly CD pack — it makes sense to pay the author. If too few people make the effort to pay, the supply of new shareware programs could well dry up.

Bug of the month



<Sigh> I guess it was inevitable. As queues in banks grow ever longer, some of us, like bugster Greg Priestley, have taken refuge in Internet banking. But is it really the solution?

Win! Win! Win!

Workshop is always on the lookout for the strangest, funniest, most interesting or downright weird software bugs. These can include code snippets, features that function poorly, or things that crash a particular application.

Anything and everything buggy deserves a mention.

Send us your favourite bug via email to bugs@acptech.net or snail mail to *APC* Bug of the month, PO Box 4088, Sydney NSW 1028, and you'll be in the running to win a software prize. Please send screen captures, example code listings or detailed instructions for triggering a bug in an application, as appropriate for your entry.

The winner's name, along with details of the bug, will appear in this column in *APC* October.

So start hunting!

Michael Smith

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Dorling Kindersley's noteworthy guides are designed to help beginners master basic computing. *Scanners & Printers* and *Installing Software* are the latest additions to the series, and effectively deal with common issues for novice users.

Both books deal with an extensive array of topics. *Installing Software* covers subjects ranging from installing basic programs and utilities, and decompressing files, to using patches and plug-ins. *Scanners & Printers* is equally impressive, covering areas such as installing and using these devices, touching up images in Photoshop and ensuring the printer produces maximum quality images.



Both titles are written in language that is easy to understand, and use colour-coded chapters for easy reference. Graphics and photographs are also used extensively; each step is illustrated with a screenshot depicting exactly what the user should see onscreen. The guides are easy to follow, and even the most inexperienced users should be able to tweak graphics, unzip files and install hardware and software in no time.

The books are compact in size, making them easy to handle whilst working onscreen, and though each title only runs to 72 pages, they present a great deal of information. At only $12.95, these books are a must for new computer users.

Alan Crawford

Author *Scanners & Printers*: Andy Ashdown
Installing Software: Andrew Easton
Publisher Dorling Kindersley
Contact Penguin Books
Phone (03) 9871 2400
Price $12.95 each
ISBN *Installing Software*: 0751313033
Scanners & Printers: 0751313025
Rating

Inside Microsoft SQL Server 2000

This may be a hefty tome, but it is also a very readable and useful title for those needing a deeper understanding of SQL Server.

It contains detailed coverage of how SQL Server manages memory and transaction logging, how the kernel interacts with the operating system, other architectural issues, and advanced coverage of query tuning, monitoring query performance, resolving deadlocks and profiling.

There are advanced topics in Transact SQL; no simple queries are described. It deals with nulls, cross joins, altering views, working with temporary tables, and topics such as working with full-text indexes.



There are only occasional screenshots, but the text has many helpful tables, illustrations and step-by-step examples. The book concludes with an annotated list of other books which the author finds helpful.

This title is definitely recommended for software developers or database administrators dealing with large SQL Server databases who wish to really understand how the database engine works and how to fully optimise their queries.

However, it is not a general reference book, and those who are new to SQL Server, SQL or databases in general should look elsewhere.

David Williams

Author Kalen Delaney
Publisher Microsoft Press
Contact Microsoft Press
Phone (02) 9870 2993
Price $145
ISBN 0735609985
Rating

Step by Step Microsoft SQL Server 2000 Programming

Another SQL book, *Step by Step* differs from the previous title in that it is definitely for the beginner. It details using the Enterprise Manager, creating databases and retrieving data. Its concluding chapters cover common tasks in Transact SQL.

The text is easy to read and screenshots abound, so you can see what is going on and what your screen should look like.

The first section covers the Enterprise Manager and its wizards, but once the book begins working with data, the Query Analyzer is used exclusively — although many of the goals could still be achieved



using the Enterprise Manager. Most step-by-step books merely show the reader how to achieve a specific task without giving them any understanding about what they have done, but this book does. Anyone who aspires to proficiency in database implementation is likely to benefit from learning SQL, rather than being locked in to a proprietary interface for one vendor.

Colour is used effectively, and important notes are highlighted distinctively throughout each chapter. Chapters conclude with a summary section that also highlights important things to remember.

This is a good introductory title and is certainly worthy of consideration by the SQL Server 2000 novice.

David Williams

Author Rebecca Riordan
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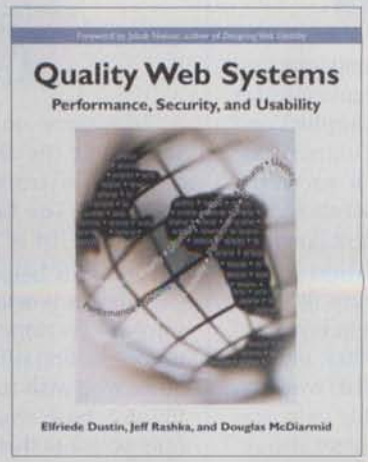
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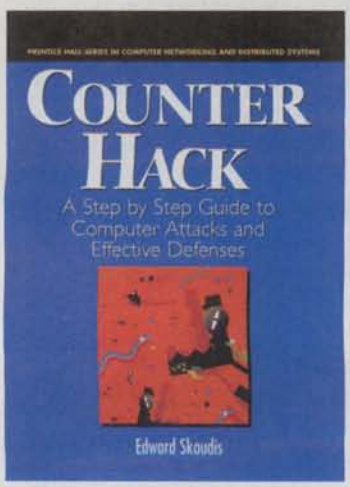
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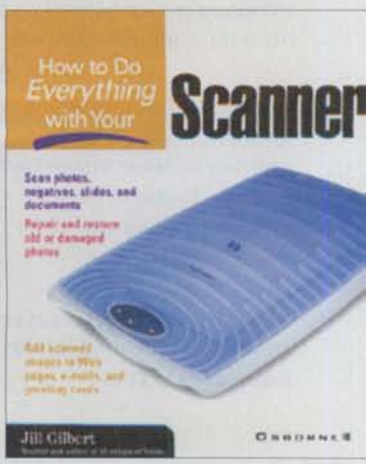


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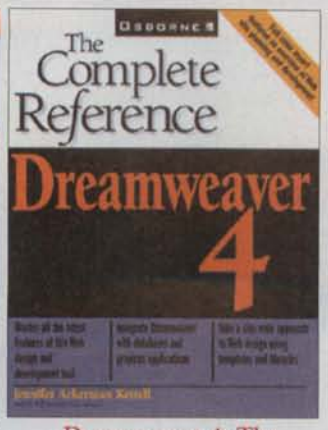
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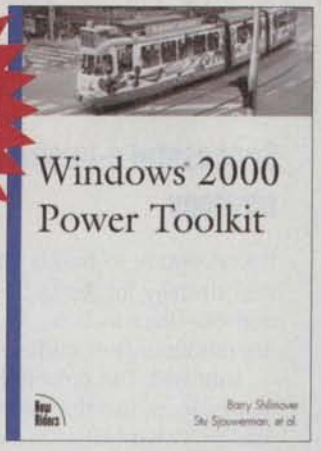
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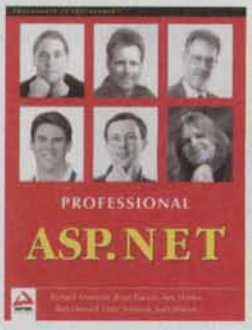
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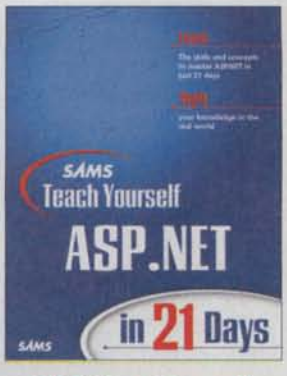
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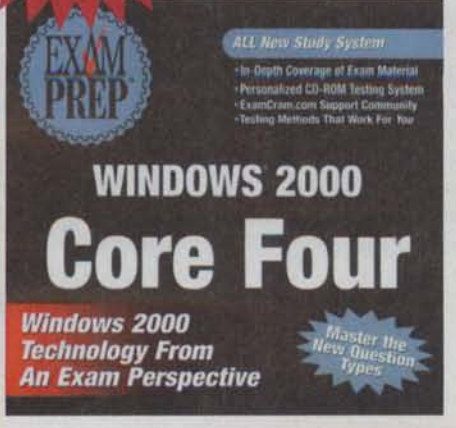
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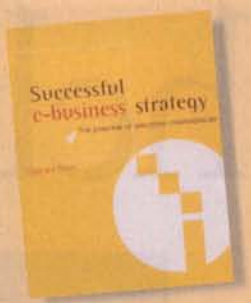
Successful e-business strategy

It's refreshing to find a book on ebusiness strategy for Australian executives, and one that includes both local and international case studies.

Subtitled *The potential of electronic marketplaces*, this title provides business leaders with a blueprint for implementing ventures to exploit the electronic marketplace with full boardroom support and ownership — not just management from the IT department.

Birch delicately balances the necessary theoretical grounding, the fundamental principals and the practical know-how for leveraging the potential of the new economy environment.

The philosophy of the book is that the principles of good business management



are the same in the new economy as in the old — great people, products and service backed by adequate funding and knowledge of the market.

Internet businesses fail for five main reasons, and the book covers strategies to address these key areas: failure to recognise the need for changes to core business processes; failure to bring in new skills; fragmented initiatives; failure to strike a balance between technology and business-driven solutions; and a lack of business definition with initiatives.

This is an excellent resource to help you compete in the new economy.

Cathie Kennedy

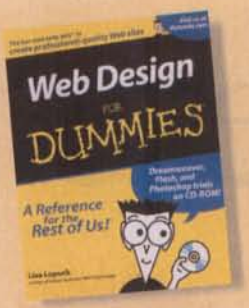
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Web Design for Dummies

Why is it that the Dummies books always use screenshots of Macs? Perhaps it's an indication of their target audience, or maybe just someone having a dig at Mac users. Either way, this title definitely targets people from a print design background — predominantly Mac users.

Most of the book focuses on how designing for the Web is different to designing for print. It covers colour depth, image compression, the limitations of HTML, interface design, anti-aliasing of text, rollover effects and bitmap versus vector graphics.

The book also covers production processes such as building a good site map; designing, printing and delivering mock-ups to clients; and even "managing a client's expectations". It's these sections that really make this title stand out from



run-of-the-mill beginner's guides. There are even a couple of pages devoted to knowing what to charge for a site!

There are lots of screenshots and diagrams; a CD with demo versions of Fireworks, Photoshop, Flash and Dreamweaver; not to mention the obligatory cheesy cartoons at the beginning of each chapter.

This book is a great introduction to the Web for old school designers, but it's not exactly cutting edge or inspirational. If you've designed for the Web before, or you are hoping to get some insight into working with HTML or scripting, then it's not for you.

Daniel Potts

Author Lisa Lopuck
Publisher Hungry Minds
Contact Hungry Minds Australia
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XML: The Complete Reference

It is arguable that the only background you require to learn XML (Extensible Markup Language) is a working exposure to HTML, but you'll need an awful lot of reference material to actually do anything useful with it. *XML: The Complete Reference* fits the bill nicely, starting from basic principles and progressing through the exotica of XML and its many derivative technologies in a manner that is informative and cheerful without resorting to brain-dead humour.

Most books with the word 'reference' in the title aren't designed for end-to-end reading, but most chapters in this tome do offer a detailed walkthrough of the basics of XML document creation. However, before long you start to come across sentences such as "It is often nec-



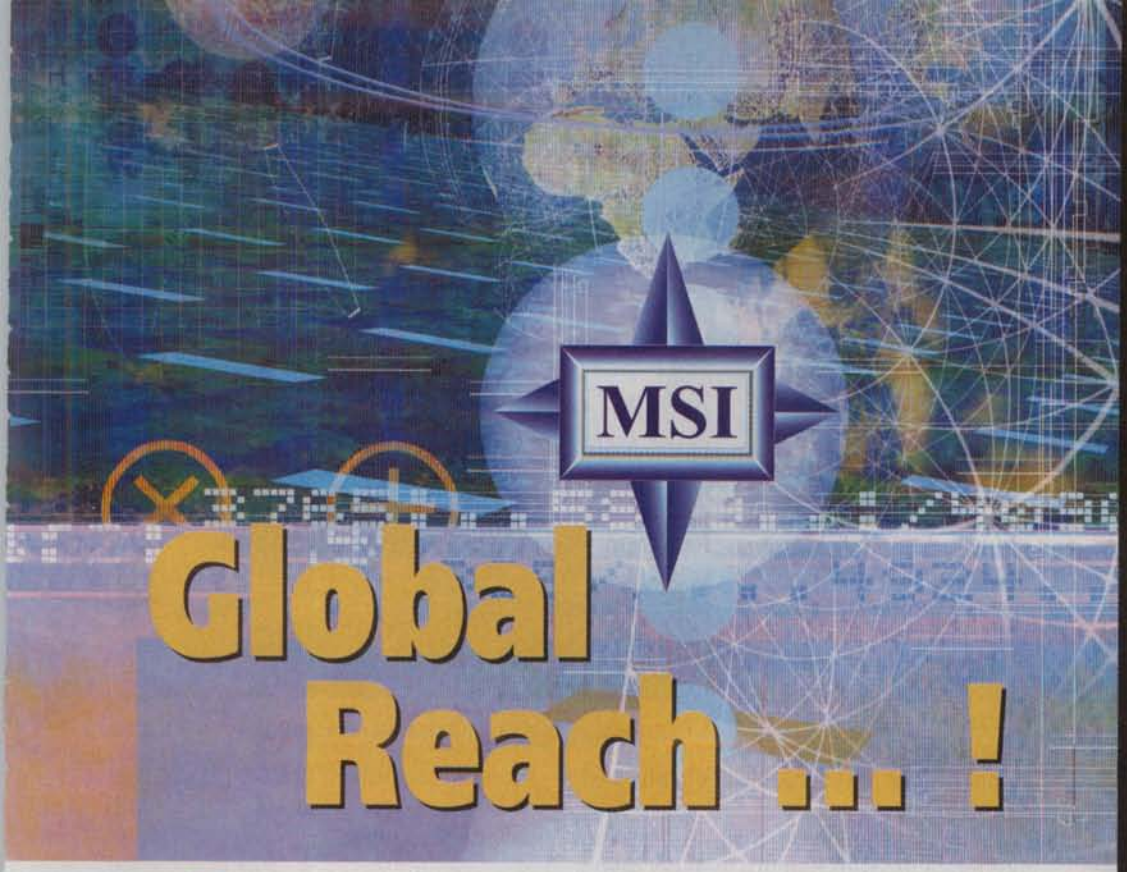
essary to generate an attribute's value at the time of transformation and based upon, but not necessarily equal to, something in the source tree" — so caution is advised. Most chapters can also be read independently.

Another useful addition to the book is the exhaustive appendices, covering DTDs, CSS, XSL and Unicode. Most of this information is available online, but it is convenient to have a hard copy. If you plan to work extensively with XML (and that covers most enterprise developers these days), *XML: The Complete Reference* is a useful addition to the shelf.

Angus Kidman

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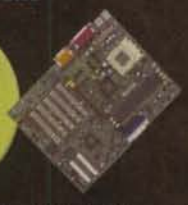
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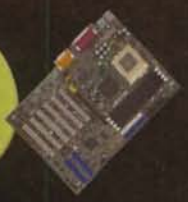
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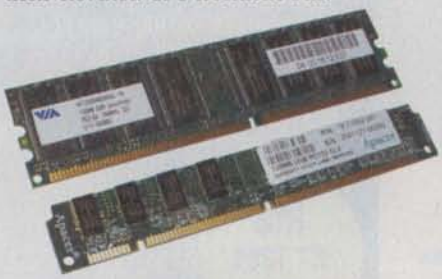
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Want to upgrade your computer's memory? It pays to know your RAM.

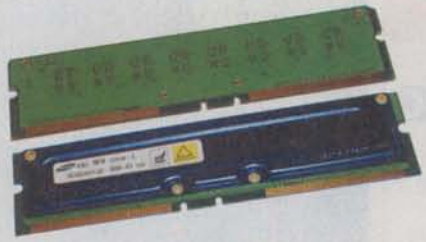
Ramp up your RAM

There are three kinds of RAM in current-model desktop computers. All of them, needless to say, are incompatible. The most basic kind of memory, standard data rate (SDR) SDRAM, comes in a selection of speed ratings. PC133 SDRAM, made to run at 133MHz or lower, is the de facto standard. PC66 and PC100 speed ratings were released earlier than PC133, and there are also PC150 and PC166 modules. These are handy for overclockers who want memory that's guaranteed to keep up with their elevated CPU frontside bus.



▲ DDR (top) and SDR (bottom) SDRAM modules

Double data rate (DDR) SDRAM is technologically similar to SDR, but it squeezes two data transfers into each clock tick, doubling its bandwidth. DDR is graded according to its maximum bandwidth, not its clock speed; for example, PC1600 DDR memory runs at double 100MHz speed and has twice the bandwidth of PC100 SDR memory. PC2100 DDR memory runs at double 133MHz.



▲ An RDRAM module (bottom) and a dummy module (top)

At the time of writing, some Pentium III computers and all Pentium 4 machines use Rambus RDRAM, which is easy to recognise by the metal heat spreaders attached to the chips. Computers that use RDRAM also need dummy memory modules installed in all empty slots. Machines with dual channel Rambus memory — including all RDRAM Pentium 4s — must have memory modules installed in matched pairs.

For desktop computer tasks, RAM speed makes surprisingly little difference to system performance. This is most evident in 'dual fuel' socket A motherboards for AMD Athlon and Duron CPUs. These boards accept both SDR and DDR SDRAM. They generally perform a little better with DDR, but the difference for business applications and games is frequently well below 10%.

The same applies to RDRAM. Pentium III machines with Rambus memory aren't much faster for desktop tasks than machines with SDRAM.

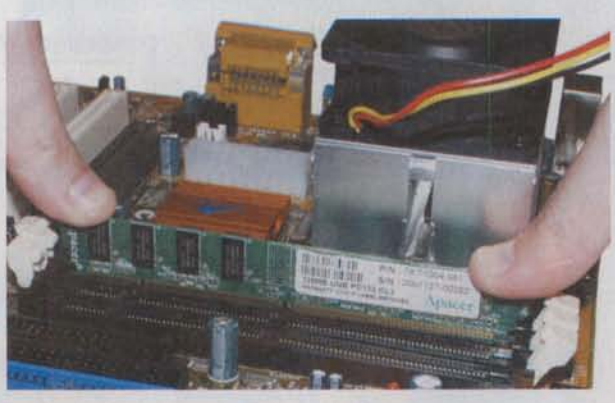
Pentium 4 users don't have a choice about which RAM to use. Currently, the only option is dual channel RDRAM. RDRAM's speed advantages for certain highly memory-intensive tasks are considerable. However, for desktop computer tasks, a cheaper SDR Athlon box can keep up with, and will often actually beat, a top-end Pentium 4.

Quantity, not quality

Changing the speed of your memory isn't likely to make much difference to your computing experience, but changing the *amount* of memory certainly can. RAM prices are falling through the floor, so it's tempting to upgrade, but you shouldn't go over the top just because RAM can be had very cheaply.

The amount of physical RAM you need is determined by the software you run. When a Windows PC runs out of physical RAM, it uses virtual memory — the 'swap file' on the hard disk. This is much slower than real RAM, so it pays to minimise its use. However, if you don't find yourself running out of physical RAM, there's no reason to add more.

People who run memory-hungry software for tasks such as pro 3D rendering, high-end desktop publishing or high-resolution image editing may find their system benefits from very large amounts of memory. Otherwise, the most Windows 95, 98 or Me systems need is 192M (128M is adequate). For Windows 2000, 256M is a sensible amount.



▲ Push the memory module into the slot until both clips click into place.

Installing RAM

All three current memory technologies use the same basic Dual Inline Memory Module (DIMM) form factor, so you install them all in much the same way.

First, take care when handling the RAM. It's sensitive to static electricity, and even a static discharge that's too small to feel can destroy a chip. However, you don't need to be paranoid about static. After you take the case off your computer, leave the PC plugged in but turned off. Touch some bare metal, such as the power supply box, before you handle the memory. It's still possible to fry your RAM after taking this basic precaution, but it's very unlikely.

Make sure the clips at the ends of the RAM slot are in the outward, unlocked position. Place the memory module in the slot so that the cut-outs in the module line up with the shape of the slot. They only line up when the module is the right way around.

Next, firmly push the memory module down into the slot until both clips click into place. You may need to exert a bit of force; don't worry, this is normal.

If you have an RDRAM computer, you need to put a dummy module in any unused slots. If you have a dual Rambus machine, you need to install memory in matched pairs. Other SDR and DDR computers allow you to install modules of any capacity into whichever slots you like.

Daniel Rutter

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Utilising your modem's fax and voice capabilities is easy under Windows 2000.

Modem messengers

Broadband Internet connections are gaining popularity, but for the next few years, most Web surfers are still likely to be relying on dialup connections. Cable, ADSL and satellite are great for downloading huge files and playing online games, but dialup is still the most sensible option for those who connect to the Web only a few times a week to check email and do a little research. In rural areas, it's often the only choice. Dialup connections are also cheaper; the installation costs are much lower than for broadband connections — usually only the cost of a modem and connection charges.

So, what else can you do with your modem? You can use it to send or receive faxes and act as an answering machine. If you have an old computer and modem, why not resurrect them and give them a new use? Even if you only have one modem, it probably sits idle most of the time. A small office or home office (SOHO) can benefit greatly when a modem is used to take care of all communications, especially when it eliminates the need to purchase an expensive fax machine. By leaving your faxes in digital form, you also save trees.



How do you find out if your modem can do more than just connect to the Internet? Most 56K modems that have been available for the past few years are fax and voice modems. The easiest way to identify your modem's capabilities is to read the box; if it lists fax and voice capabilities, you're set.

Faxing with Windows 2000

Windows 2000 comes with its own faxing capabilities, so there is no need for third-party software. Sending faxes under Windows 2000 is as easy as selecting Print from your word processor's File menu. To receive faxes, you have to do a bit of configuring.

Fax Service is automatically installed whenever Windows 2000 detects a fax modem connected to the computer. When you want to send your first fax, create the document in your word processor and select the Print command from the File menu. Select Fax from the Printer drop-down menu and click OK. This brings up the Send Fax Wizard. If this is the first time you have sent a fax, it prompts you to enter your personal details, which then appear on the fax cover sheet. You can edit this information later by selecting Fax from the Control Panel.

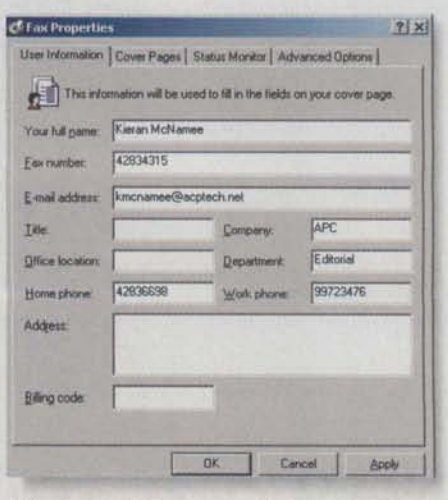
Next, enter the name and number of the recipient. If they are in your Microsoft Outlook address book, you can click the Address Book button and quickly add the person's name and fax number. Your fax can be sent to more than one recipient — just click Add after entering each person's fax number to add them to the list.

After clicking Next, you're asked if you want a cover page. There are cover page templates or you can create your own template by selecting Fax from the Control Panel and New from the Cover Pages tab. The details you entered previously are automatically inserted

The next step is setting the time you want the fax to be sent. You can send the fax immediately or schedule it to be sent later. When you click Next a summary is displayed. If all is in order, click Finish. If you scheduled the fax to be sent immediately, you will hear your modem begin dialling. If you scheduled the fax to be sent at a later time, the document is added to the fax queue and waits for the appointed time.

Windows 2000 Fax Service is not configured to receive faxes by default. To receive faxes, you must first open the Fax Service Management console from Start, Programs, Accessories, Communications, Fax. Select the Devices icon, right-click your modem and select Properties. In the modem's Properties window, tick the 'Enable receive' checkbox and set the number of rings the modem should wait through before answering. The second tab in this Properties window allows you to set where the received faxes will come out. You can specify a printer or you can cut down on paper wastage by storing faxes in a folder or sending them to a local email inbox.

After you have enabled Windows 2000 to receive faxes, your modem will be on the lookout for incoming calls. If the phone line



▲ Your user details appear on the cover sheet.

Waiting game

Some people want to know they have a call as soon as it comes in, even if they're on another call at the time. This is what call waiting is for. If you're a Telstra customer, just press *43# on your keypad to enable it. A disadvantage of the service is that if you don't disable it (press #43#) before connecting to the Internet, you are likely to lose your connection if someone tries to call you.

What happens if you want to connect to the Internet, but don't want to miss important calls? You can make sure that your phone line is never tied up by upgrading to a broadband service (such as ADSL or cable), or you can install an additional phone line. However, if these options are not feasible, there is another possibility.

Telstra's new iCall Waiting service enables you to receive incoming phone calls through your computer. If you are connected to the Internet when someone calls your home phone, the call is diverted to your computer using Voice over IP technology. You can then take the phone call using Microsoft NetMeeting and a headset.

The iCall Waiting service costs $5.50 per month. For more information, head to telstra.com/comms/icallwaiting.

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ACT: 02 6253 2677, **WA:** 08 9277 1344, **NT:** 08 8953 2929,**VIC:** 03 9747 8036, **NSW - Auburn:** 9648 1811, **Burwood:** 9744 6299, **Bondi:** 9387 3888, **Central Coast:** 4322 5115, **Chatswood:** 9415 1981, **Coffs Harbour:** 6652 8533, **Dee Why:** 9972 2622, **Double Bay:** 9362 4348, **Gordon:** 9418 2945, **Hornsby:** 9482 8325, **Hurstville:** 9585 9988, **Mosman:** 9953 1684, **Miranda:** 9589 2300, **Newcastle:** 4940 0030, **Parramatta:** 9687 1896, **Penrith:** 4721 1046, **Rockdale:** 9567 9785, **Sydney:** 9299 0022, **Wollongong:** 4423 6516



▲ All messages recorded while you were out are available from the inbox.

you are using only receives faxes, you don't need to do anything further. If you also receive voice calls on the line, you need to enable manual answering from the Status Monitor tab in Fax Properties. When a call comes through, a prompt asking whether you want Windows 2000 to answer it appears. If it is a voice call, click No and answer the call with your handset. If you hear a fax tone, click Yes so that Windows 2000 can receive the transmission. If you know that the next incoming call is going to be a fax transmission, you can make things easier by selecting the Answer Next Call as Fax checkbox from the Fax Monitor.

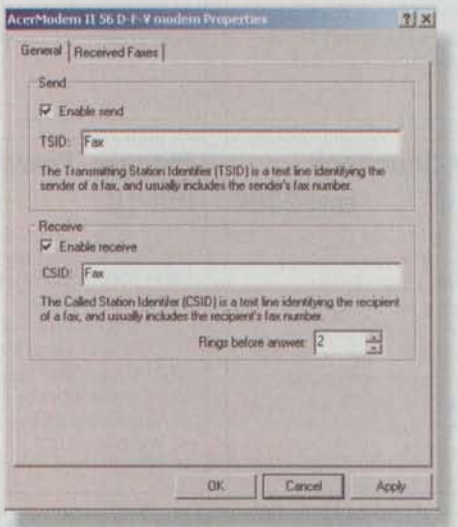
Modem answering machines

There are many programs that can help turn your computer and modem into a communications centre. Imagine using your modem as a calling number display unit and an answering machine. This setup can replace your old tape-chewing answering machine, and can also add professionalism to an ordinary SOHO environment.

To use your computer and modem for recording voice messages, plug the phone line into the Line socket on your modem and then plug your phone into the Phone socket. Even when the computer's switched off, you can still use the phone. When you install a voice mail application on your computer, it intercepts incoming calls after a certain number of rings, greets the caller, then takes a message and stores it in your voice mail box. Most programs allow you to dial remotely into your voice mail box and have your messages played to you over the phone.

Many communications programs with voice mail features don't work very well. Some are designed for US telephone systems; others are just badly designed. Our favourite program is Fax-Talk Messenger Pro. The full version costs $US99.95, but see the cover CDs for a 15-day trial.

FaxTalk is made up of several applications, each of which performs a specific job. The FaxTalk CallControl sits in your System Tray waiting for incoming calls, the FaxTalk Speakerphone allows you to make calls through your speakerphone-enabled modem, and the FaxTalk Messenger Pro application manages all your messages.

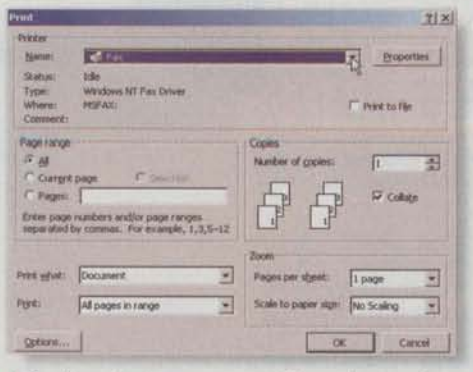


▲ You must configure Windows 2000 to receive faxes.

Setting up FaxTalk is easy, but it can take some time. On installing the application you are asked to select the modem you wish to use. This is then tested to determine its capabilities. After installation you can open FaxTalk Messenger Pro from the Start menu or from the CallControl icon that sits in the System Tray. By default, CallControl loads automatically when Windows is started. To change this or any other aspect of FaxTalk, right-click on the CallControl icon and select the relevant item from the Setup menu. As long as Auto Answer is enabled, FaxTalk answers incoming calls after two rings. You should also take a look at the Modem and Voice Messaging options in the Setup menu to make sure all the settings are to your liking. You might even want to record your own greeting.

The main FaxTalk Messenger Pro application manages all your voice messages. From here you can set up your voice messaging mailbox system, listen to received voice messages and manage your contacts. The interface is similar to Outlook: your inbox, outbox and other items are on the left. As you would expect, the inbox holds all your voice messages and faxes if you are using FaxTalk for faxing. You can use FaxTalk's faxing feature if you like, but it is no better than the basic Windows 2000 feature, Fax Service.

Kieran McNamee



▲ Sending a fax is as easy as printing a document.

Windows shareware

Button Studio 1.44

Use this program to easily create buttons for Web pages and presentations.

PhonePad 2.7

This tool allows any user to send a phone message straight to your inbox.

Serv-U 3.0

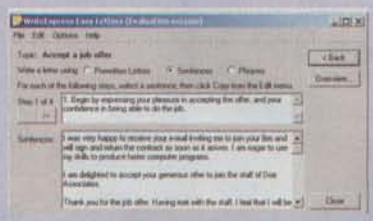
With this easy-to-use program you can turn your computer into a FTP server.

Ultimate ZIP Cracker 6.5

Open protected files in an instant with this tool to retrieve lost passwords.

WriteExpress Easy Letters 2001

This utility provides all the assistance you need to construct any type of letter.



All these programs and more can be found on this month's cover CDs, along with more detailed reviews.

For a complete archive of *APC* Windows columns, see apcmag.com.

Keiran McNamee can be contacted at kmcnamee@acptech.net.

Get off to a better start

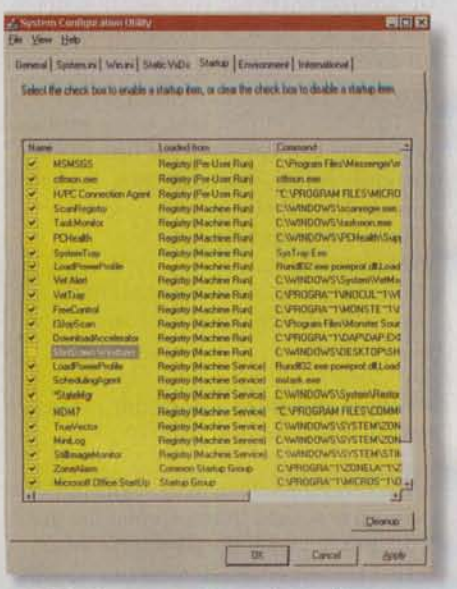
Tired of slow Windows startups and shutdowns? Take control.

Microsoft has used shorter shutdown times to market each successive version of Windows. The catch is, few people just boot up Windows, play with it and shut down. Most users run programs from Windows, and when they go to shut down, each program delays the process.

Our test system (a 500MHz Pentium III with 160M of RAM) shuts down Windows alone in 12 seconds, but takes 36 seconds with Microsoft Word and Outlook 2002 running. Boot time — from pushing the On button until the hourglass cursor goes away and the desktop is ready to use — is 96 seconds. This means about six minutes are spent waiting during an average two-reboot day. Of course, you can always just switch off your PC, but if you do, Windows takes even longer to boot next time as ScanDisk makes sure you didn't break anything.

If you're the impatient type, tools such as ShutOff 2000 ($US15 from www.e-llusion.co.za), ShutDown (free from www.dimaware.com), and AutoExit can shorten the wait. They sit in your icon tray and offer several shutdown options, including forcing applications closed (instead of waiting while they do housekeeping) and shutting down the system at a certain time. This can cause problems if you haven't saved your work. The programs may not have enough time to save your documents, so only force the system to shut down if everything is saved.

If you use one of these tools, the results can be astounding. For example, ShutOff 2000 shut down the system running Word and Outlook in just seven seconds. That's 81% faster and 29 seconds saved.



▲ MSConfig can speed startup by disabling unnecessary programs.

Standard startup is even more time-consuming than shutdown. At every startup Windows primps itself, loads everything up and cleans up any messes left over from your last session. This means an excruciating wait, particularly on slower machines.

There is little you can do to speed up startup, apart from using MSConfig (in Windows 98 and Me only, select Start, Run, MSConfig, Startup tab) to scroll through the list of items loaded at startup and disable unnecessary ones. However, you can make the process a little more interesting by using programs such as CoolBar Animator and Kambialogo (free from www.codearchive.com/~suarez) to change the images your computer displays when starting up or shutting down.



▲ Programs such as ShutOff speed up shutdown by wrestling applications into submission.

As you're going to be waiting so long anyway, why not get Windows to do something useful during long pauses? Startup Launcher and Shutdown Launcher run specific programs or tasks whenever your system is starting or stopping.

Anything can be added to these two programs' Launcher Manager interfaces, which include built-in wizards to automate chores such as emptying the recycle bin or Internet Explorer's temporary file folders, defragmenting the hard drive and copying files from one site to another.

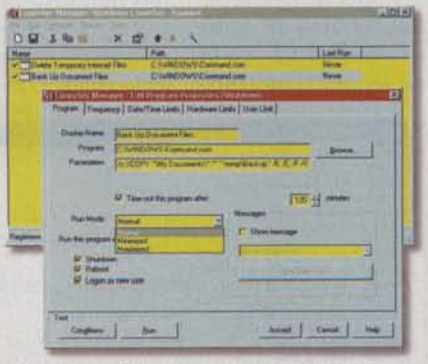
Both programs can limit how many times each task is executed per day, how frequently it's run, who is allowed to run it and what time of day it can run. On a notebook, they even check to see whether it is operating on mains or battery power before running the task. Startup Launcher has a tab with the same features as MSConfig, and Shutdown Launcher emulates ShutOff's trick of forcing the applications to close immediately. It also offers timed shutdown.



These programs are particularly useful in corporate environments as a means of enforcing data management policies. For example, a shutdown script could delete temporary Internet files, empty the recycle bin, copy the contents of A:\My Documents over the network to a dedicated backup directory, and send the administrator notification of the shutdown internal usage logs.

Startup and Shutdown Launcher cost $US20 each or $US30 together as Power Launcher Plus. You can download or purchase from www.shensoft.com. Trial versions of some of the programs discussed here can be found on this month's cover CDs.

David Braue



▲ Startup and Shutdown Launcher automate housekeeping and tasks such as data backup.

David Braue can be contacted at david@braue.com.

Want to run more than one Web site from your server? Linux makes it easy.

Virtual hosting with Apache

Virtual hosting allows you to host more than one Web site on the same computer. There are two main ways it can be done — one method uses Apache.

To understand hosting with Apache, you need to know a bit about the history of HTTP. Version 1.0 of the Hypertext Transfer Protocol connects to port 80 (the HTTP port) and sends a request such as the one below when a client wants to request a page from an HTTP server.

```
GET /directory/file.html HTTP/1.0
```

You can observe this process if you pick a Web server, telnet to port 80, and type in a similar GET request. To retrieve the top-level page from the Web server, put in GET / HTTP/1.0 (you also need to press Enter twice after typing this, as there are some additional headers that can be supplied).

The GET request only specifies the filename portion of the URL, not the hostname. This means that if you want to run two Web sites with different hostnames on the same computer, there is no way (as part of HTTP) for the Web server to distinguish which site a client wants to access.

IP-based virtual hosting was developed to get around this problem. You assign your Web server two different IP addresses, and use DNS to point www.example1.com to one of those IP addresses, and www.example2.com to the other. The Web server is able to distinguish which site the client wants to connect to by looking at which IP address the request is sent to.

Using different IP addresses for each virtual Web site works well for hosting a few Web sites on one computer, but for companies such as ISPs, which host hundreds of sites, all those IP addresses can be a problem. Version 1.1 of HTTP includes an extra header (the Host header), which allows the client to explicitly tell the server the hostname of the site it is connecting to. This is known as 'named-based virtual hosting'. This can allow lots of Web sites to be hosted on the same IP address. Figure 1 shows how to telnet to a Web server and make an HTTP 1.1 request with the Host header.

```
g@kylie.netcraft.com.au: /h/g
[g@kylie g]$ telnet www.example.com 80
Trying 10.0.0.4...
Connected to www.example.com.
Escape character is '^]'.
GET / HTTP/1.1
Host: www.example.com

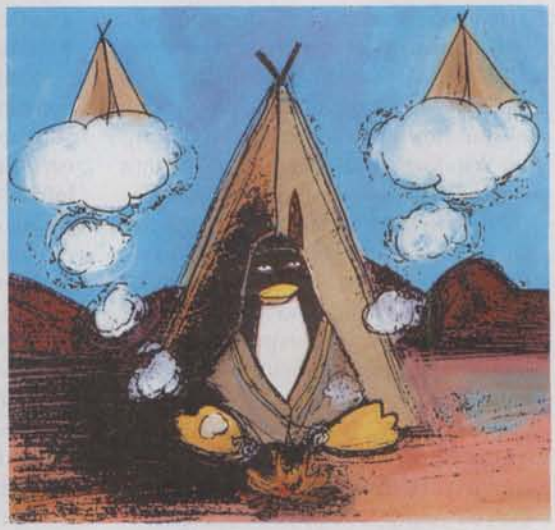
HTTP/1.1 200 OK
Date: Thu, 07 Jun 2001 16:03:02 GMT
Server: Apache/1.3.19 (Unix)  (Red-Hat/Linux) mod_ssl/2.8.1 OpenSSL/0.9.6 DAV/1.
0.2 PHP/4.0.4pl1 mod_perl/1.24_01
Last-Modified: Thu, 29 Mar 2001 17:53:01 GMT
ETag: "1bd75-b4a-3ac3767d"
Accept-Ranges: bytes
Content-Length: 2890
Content-Type: text/html

<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 3.2 Final//EN">
<HTML>
 <HEAD>
  <TITLE>Test Page for the Apache Web Server on Red Hat Linux</TITLE>
 </HEAD>
```

▲ Figure 1: Demonstration of the HTTP 1.1 Host header

There are two main disadvantages to name-based virtual hosts. First, some old Web clients can't access name-based hosts because the server isn't able to determine which virtual host they are trying to access. As version 1.1 of the HTTP is dated January 1997, this is now only a very minor issue.

Another important disadvantage is that SSL (Secure Sockets Layer) Web sites must use IP-based virtual hosting due to a catch-22 at connection time. SSL encrypts the entire HTTP transaction, including the GET, Host and other headers, so the SSL protocol negotiation happens before any headers are sent. However, to conduct the SSL negotiation, the Web server software needs to know which host the client is trying to connect to. Unless IP-based virtual hosting is being used, this is impossible to determine.



Setting up

To set up IP-based virtual hosts, you need additional IP addresses to assign to your server, and you also need to adjust your networking configuration to respond to these addresses. Linux has a facility called 'aliasing', which allows you to assign more than one IP address to a physical network interface. These aliased interfaces are named in the same way the real interface is, but have a colon (:) and a number on the end. For example, if you have an Ethernet card with the device name eth0, the first alias is eth0:0, the second is eth0:1, and so on.

The method of setting up IP aliases depends on your Linux distribution. For example, if you want to set up an alias on an Ethernet card using Red Hat Linux, you create a file called /etc/sysconfig/network-scripts/ifcfg-eth0:0, based on the existing ifcfg-eth0 file. If ifcfg-eth0 contains the following:

```
DEVICE=eth0
BOOTPROTO=none
IPADDR=10.0.0.1
NETMASK=255.255.255.0
ONBOOT=yes
```

then your ifcfg-eth0:0 file could contain:

```
DEVICE=eth0:0
BOOTPROTO=none
IPADDR=10.0.0.2
NETMASK=255.255.255.0
ONBOOT=yes
```

To start up the new aliased interface without rebooting, type /sbin/ifup eth0:0.

Once you have the new aliased interface working (to test it, ping the new IP address), start on the Apache configuration. This involves modifying the server's httpd.conf file (usually located in /etc/httpd/conf).

To define a virtual host, add a new section to the configuration file (usually near the end) called <VirtualHost>. It should contain the following:

```
<VirtualHost 10.0.0.2>
 DocumentRoot /home/example2/html
 ServerName www.example2.com
</VirtualHost>
```

There are three important points to note in this example:

- The IP address given in the <VirtualHost> directive is used to match against the IP address to which the client connected.
- The DocumentRoot directive defines where the files to be served from this virtual server are located.

- The ServerName directive is only used when the server generates self-referring URLs and error messages; it is not used when Apache is determining which virtual host a request is intended for.

Once you have modified your server's httpd.conf file, you need to reload Apache and place some content in the DocumentRoot directory you specified.

To test the virtual hosts, just use a Web browser to attempt to access both sites. If you have not yet added DNS server entries for the new virtual host, you can access the Web site using an IP address (for example, http://10.0.0.1).

Name-based virtual hosts

Setting up a name-based virtual host involves more work on the httpd.conf file, but no reconfiguration of IP addresses.

As Apache supports name-based and IP-based virtual hosts at the same time, you need to tell Apache what IP address you will be using for the name-based virtual hosts. This is done with the NameVirtualHost directive, which must be placed outside any <VirtualHost> sections (see figure 2).

In the IP-based virtual host example, only one <VirtualHost> section was added — for the second virtual host. The first virtual host used the default ServerName and DocumentRoot defined elsewhere in the configuration file. However, name-based virtual hosts require a <VirtualHost> section for each host, including the 'real' or non-virtual hostname of the server (see figure 2 for an example).

The NameVirtualHost directive tells Apache that more than one virtual host will be using the same IP address. The ServerName directive is used to match against the hostname the client supplied in the Host header.

Testing name-based virtual hosts can be slightly trickier if the DNS entries for the hosts haven't been set up. If you use an IP address in the URL, the client isn't able to send the Host header the server is expecting. If you test from a Linux client, you can add temporary entries in /etc/hosts for those hostnames, or you can telnet to the server and manually enter the GET request with the Host header.

If you test a virtual host from the same machine as the server, make sure that the hostname of the server is listed in /etc/hosts with its real IP address, not the loopback address of 127.0.0.1. If you connect to the loopback address, Apache isn't able to find 127.0.0.1 in the configuration file, and the default server configuration is used instead of the appropriate virtual host. To fix this, edit /etc/hosts, and put in the real IP address for the server's hostname (don't completely remove the 127.0.0.1/localhost entry).

To aid in checking your virtual host configuration, you can run httpd -S. This describes the virtual host settings you placed in the configuration file.

```
NameVirtualHost 10.0.0.1

<VirtualHost 10.0.0.1>
  DocumentRoot /home/example1/html
  ServerName www.example1.com
</VirtualHost>

<VirtualHost 10.0.0.1>
  DocumentRoot /home/example2/html
  ServerName www.example2.com
</VirtualHost>
```

▲ Figure 2: Name-based virtual host configuration

Virtual host customisation

Nearly any directive that can be used in the main server configuration can be used inside a <VirtualHost> section, but its effect is then limited to that virtual host. Directives specified outside a <VirtualHost> section act as defaults for inside those sections.

Many people want a separate log file for each virtual host. As the default log file format doesn't list the virtual hostname connected to, it is impractical to separate the log entries out later. Within each <VirtualHost> section, you can add two lines similar to those below, and each Web site can have its own set of access and error logs.

```
CustomLog /var/log/httpd/access_log-www
.example1.com common
ErrorLog /var/log/httpd/error_log-www.example1
.com
```

The other alternative is to use just one log file, but modify the log file format so that the virtual server hostname is included. To do this, add the string %v to the LogFormat directive. For example, if you are using the common log format, you change the following line:

```
LogFormat "%h %l %u %t \"%r\" %>s %b"
common
```

to:

```
LogFormat "%v %h %l %u %t \"%r\" %>s %b"
common
```

Linux shareware

Firestarter 0.7

An easy to use and secure firewall tool for desktop Linux machines that uses the new features of Linux kernel 2.4.

Gabber 0.83

This GTK messaging client interoperates with most instant messaging networks and has stacks of unique features.

GnomeToaster 20010424

A CD recording application for GNOME, this tool doesn't require lots of free hard disk space and supports MP3 and other digital audio formats.

Opera 5.0

Now available for Linux, this is a small, fast, reliable and standards-compliant Web browser with Google search tool and built-in download management.



Partition Image 0.36

This product can create multiple, identical desktop machines for office environments, including saving and restoring disk partitions.

All these programs and more can be found on this month's cover CDs, along with more detailed reviews.

The Apache documentation has more in-depth information about Apache's virtual hosting support. It is available at www.apache.org/docs. An Australian mirror of the same information is available at http://apache.planetmirror.com.

Geoffrey Bennett

Geoffrey Bennett can be contacted at geoffrey@netcraft.com.au.

For a complete archive of *APC* Linux columns, see apcmag.com.

Creating artwork on your PDA is easier than you think.

Art in the Palm of your hand

If you've ever wanted to do any kind of drawing on your Palm or Pocket PC, you will have noticed that these tasks aren't very well catered for. The Palm m100 and m500 series have a very simple sketching tool that allows freehand sketches in black and white, but other Palm devices have nothing. The Pocket PC Notes application works in a similar way to the m100 and m500s, allowing you to make simple black and white sketches, change your 'digital ink' into standard text, and record sound in the note.

Palm and Pocket PC sketches can be imported to the desktop. Palm does this through the Palm 4 desktop application. Pocket PC allows you to transfer the notes you create from your My Documents folder to your desktop PC as RTF documents that can be read by just about any word processor, or synchronise directly with Microsoft Outlook Notes, depending on your Activesync settings.

There are also plenty of shareware options. There are literally dozens of drawing programs available for Palm OS. However, it can be hard to choose which one to use. *APC* tested a number of these to help you make an informed choice.

If you have a Palm III, V or Vx and want similar simple sketching features to the Palm m100 and m500, there are many alternatives to choose from. *APC* tested several freeware applications. Free Palm Design allows you to add titles and dates, and to categorise your sketches so they're easy to find. You can even beam your sketches to a friend. It's a simple freehand drawing tool that doesn't allow you to change the pen thickness, draw shapes, fill colours or manipulate your drawings in any way, but it gets the job done if you just want to do the occasional simple drawing.



▲ DrawIt is by far the best free drawing application available for the Palm.

DrawIt (www.drawit.co.nz) is a good advanced drawing freeware program made by Andrew Empson from New Zealand. It allows you to customise the toolbars to show the tools you want to use in the order you want them displayed. As it is modular, new tools can be added when updated versions are released. DrawIt includes pencil, line, crayon, wet felt, spray paint, smear, blur, burn, dodge, clone, fill and erase drawing tools, as well as square and circle shape tools, and a cool mirror tool for creating kaleidoscope-style images.

It is a bitmap-based drawing tool, which means it draws using pixels, and if you adjust the size or proportions of your pictures they can get a bit distorted. DrawIt has a tool for importing and exporting drawings to your desktop PC. At present, it only supports Palm OS 3.5 or higher; support for monochrome is still being tested. DrawIt is by far the best free drawing application available for Palm to date.

TealPaint is one of the best-known shareware drawing programs for the Palm. Some Palm PDAs come with a 'lite' version of this program on their install CD. It supports colour and monochrome Palms, and comes with a program to import and export images to your desktop PC. TealPaint is shareware and costs $US17.95 to register. TealPoint Software has a wide range of interesting applications for the Palm (see www.tealpoint.com).

TealPaint supports multiple image databases and annotated records. You can use image templates (TealPoint Software provides some, and some can be found on this month's cover CDs). You can lock backgrounds so they don't change, and there is support for basic animation and thumbnail image features. It doesn't have quite as many drawing tools as DrawIt, but it does provide freehand, line, constrained 45 and 90-degree line, box, filled box, rounded box, filled rounded box, circle, filled circle and erase tools. You can also write text with selectable fonts and fill in your shapes after drawing them with the paint bucket tool. It has 16 draw patterns and 12 brushes to choose from and includes all the editing features you'd expect to see in a drawing program. If you're really serious about drawing, give both TealPaint and DrawIt a try and decide for yourself. They have overlapping features and some unique ones. If you're using a Palm without the 3.5 OS upgrade, you'll have to stick with TealPaint.



There are also some tools available that allow you to integrate drawing into the to-do list, memopad and other built-in Palm applications. These will be discussed in a future Workshop column.

Pocket choices

For those with a Pocket PC, there are two built-in methods for creating freehand drawings. The first and more commonly known method is to bring up the Notes application on your Start menu, create a new note and select the drawing tool that's located at the bottom of the screen. There is not a lot of flexibility with this option. You can create simple freehand sketches and even write hand-written notes to convert to text later. However, you can't adjust the pen width, change the ink colours or create shapes with this application. Your notes synchronise with Outlook Notes or can be accessed on your PC through the My Documents folder. You can modify them on your PC and send them back to your Pocket PC with ease.



▲ TealPaint can import and export images to a desktop PC.

A second, less familiar method of creating Notes is by using Pocket Word. Run Pocket Word and create a new document. Next, select the View toolbar, check the Toolbar item and choose the Drawing view. From here, you'll notice a grid view and a toolbar at the bottom of the screen. You can select the pen thickness, ink colours and fill colours here. Only freehand drawing is available, but there is a wide range of colours to choose from and you can fill in the objects you create. You can open these documents in Word on your desktop, which gives you a lot of flexibility. You can also take ordinary Word documents, put images in them on your desktop PC, then save them to your Pocket PC for viewing or editing later. It's simple, effective and free.

This is just as well, as freeware and shareware drawing applications for the Pocket PC are few and far between. The simplest and least expensive one *APC* found is the $US9.99 shareware package, Drawing Notes from PDAutilities.com (www.pdautilities.com). It has all the drawing capabilities of Pocket Word and you can set the background colour, modify the pen colour and draw straight lines, boxes and circles. You can put multiple drawings in one file, but it saves the information in a proprietary format and you can't share what you've drawn with any other application or your desktop PC.

It's very easy to use, but its only real advantage over Pocket Outlook is the range of shape tools. Pocket Word and the Notes application don't have the drawing features, but you can use their drawings elsewhere and take quick ink notes and convert them to text later.

Pocket Artist from Conduits (www.conduits.com/ce/artist) is by far the most professional and most expensive ($US49.95) application. You can create 24-bit high-quality drawings and save them as BMP or JPG files that any PC or other Pocket PC can easily open. Pocket Artist has all the drawing tools mentioned above and some serious editing capabilities. It has several image processing filters, such as find edges, emboss, sharpen, motion blur, desaturate and gaussian blur. It also includes colour blenders, which allow you to mix two colours to make a new one. They can be simple or complex and provide a range of highly customisable visual effects.

Pocket Artist also allows you to do screen captures of other Pocket PC programs. This is a nice feature, but it's free with Gigabar, so don't make any purchase decisions based on this option alone.

This program has all the high-end features you'd expect to see in a professional drawing package for a desktop PC, and its price tag reflects this. It uses bitmapped images, which can be large, but uses standard graphics formats that are compatible with just about any program on the market.

One Cat Doodler ($US34.95 from www.onecatweb.com) takes a different approach from Pocket Artist. It's more like a mobile version of PowerPoint. It uses a combination of vector graphics, bitmap images and formatted paragraph and bulleted text to create presentations. You create a multipage drawing and then use the slide show feature. Each page is a fully editable drawing, which can be useful for tweaking slides.

Its Library function allows commonly used drawing objects to be stored into a central repository that is organised into categories. Each object has a thumbnail preview for easy selection.

One advantage of using the Library compared to standard clip art collections is that library objects are stored only once regardless of how many times they are used. This saves memory. Any changes you make in a drawing need to be stored in that drawing, but you can also make changes to library objects so that all existing drawings that use the common object reflect the changes.

Vector graphics allow you to create graphics where each stroke is stored as a separate, editable object. This allows you to easily modify any aspect of your drawing, and gives near-perfect scalability of the drawing without image quality loss. It also tends to take up less space than bitmap-style graphics. A disadvantage of using vector graphics is that the number of special effects and drawing tools is much more limited. This program has its own proprietary file format, but it allows you to import or export standard BMP files for use with other programs.

Each of these tools and methods of drawing on your PDA has its advantages and disadvantages. Give them a try (most are included on this month's cover CDs) and find out which one works best for you.

Ronald Rosenbaum

Ronald Rosenbaum can be contacted at ron@ats.au.com.

PDA shareware

Ababall

This breakout-style game for your Palm offers advanced graphics and sound, 32 levels with full colour 2D and 3D graphics, quick action and good sound.

G-Pod

Fly through tunnels while avoiding enemy ships in this arcade-style game for your Pocket PC. It has smooth graphics and excellent sound.

G-Prime

More than just another Galaga clone, G-Prime gives you multiple levels, weapons and shields to use to fight the evil alien attackers.

The Beast from Uranus

Try to shoot evil monsters from Uranus (and other planets) using your Palm. It's more fun and less disgusting than it sounds.

V-Rally



Available for Palm and Pocket PC, this racing game allows you to drive a Peugeot 306 MAXI, Mitsubishi Lancer WRC, Ford Escort WRC or Subaru Impreza WRC.

All these programs and more can be found on this month's cover CDs, along with more detailed reviews.

For a complete archive of *APC* PDAs columns, see apcmag.com.

Contextual menus can make life much easier for Mac users.

Keeping in context

Some Mac bigots are fond of telling the world about how Microsoft copied this or that Windows feature from Mac OS, but it's really a two-way street.

One of the most useful Windows features to find its way into Mac OS is the contextual menu. Operated by holding down the Ctrl key and pressing the mouse button, the contextual menu contains a list of commands relevant to the item your mouse is pointing to. For example, in Microsoft Word you can Ctrl-click on a squiggly red underline to correct a misspelling. StuffIt Deluxe uses the contextual menu to allow you to see what's inside an archive without opening it.

Since Apple persists with single-button mice and trackpads, the contextual menu tends to be one of the most under-utilised features. If you've added a multi-button mouse with appropriate driver software, the right button can be used to operate the contextual menu. Microsoft's IntelliMouse Explorer is an excellent example, but others come with Mac support and even more can be used in conjunction with the USB Overdrive shareware driver. You may have to adjust a setting in the relevant control panel to assign Ctrl-click to the right-hand button.

There is a software solution available that allows you to hold down the mouse button to simulate a Ctrl-click. This is a feature of FinderPop (which we'll discuss in more detail below) and Look Mom, No Hands!, although the latter doesn't currently work with Mac OS 9.1.

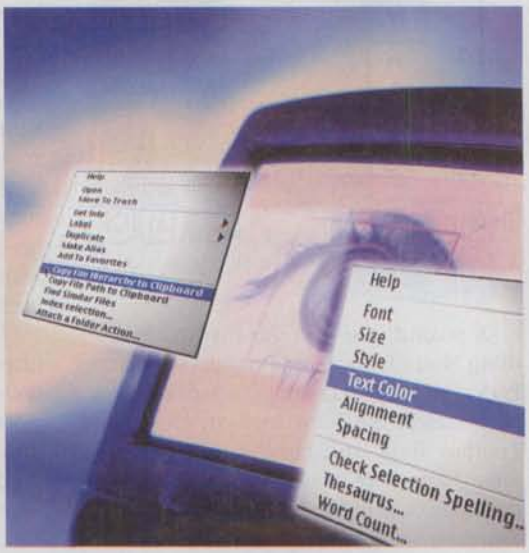


▲ Many packages, including AppleWorks, use the contextual menu to provide shortcuts to commands.

Applications

Applications often provide contextual menus. If you're not already using them, it's worth investigating what's available in the programs you use regularly, as they can save you a great deal of time.

Even some older programs have good contextual menus. Photoshop makes use of this feature as far back as version 4.0. When using the Brush tool, for example, the contextual menu allows you to switch brush size without returning to the tool palette.



Add-ons

Developers can also create contextual menu modules (CMMs) that extend the contextual menu. These pieces of software are stored in the Contextual Menu Items folder within the System folder. Usually, they work in the Finder on files, folders and volumes. They may be standalone products, or they may work with other software. Since CMMs are normally quite small and simple, they are often distributed as freeware.

Most CMMs work with Mac OS 8 or 9, although some have other requirements as well. Mac OS X has contextual menus, but it only supports CFM (Code Fragment Manager) plug-ins, not the older SOM (System Object Model) format.

Installation usually involves dragging the CMM onto the closed System Folder, allowing the Finder to route it to the Contextual Menu Items folder, and restarting. Check the individual documentation for additional instructions.

Some CMMs only do one job, while others implement multiple functions. Both have pros and cons. Specialisation makes it easier to add just the tasks you need to the menu. Multifunction CMMs allow developers to group related commands in submenus, but they also increase the likelihood of duplicating functions. We'll restrict our discussion to single-function CMMs.

FilePathToClipCMPlugin is a plug-in CMM that copies the path to the selected file to the clipboard. This function is mainly useful when creating AppleScripts that must access specific files, and when writing documentation and tutorials.

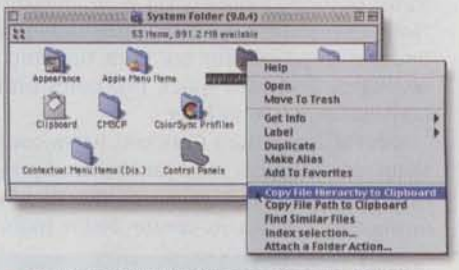
FileHierToClipCMPlugin puts a hierarchical list of a folder or volume's contents onto the clipboard. Again, this function is useful when creating documentation.

Unlike using Select All and Copy from the Finder's Edit menu, this CMM descends recursively through any subfolders. It also copes with a larger number of items than the Select All method, although it can run out of memory when used on large folders.

One of the more tiresome jobs when sending files to a Windows user is putting the appropriate suffixes on the ends of the filenames (such as DOC for Microsoft Word) so that Windows knows which application to open them with. Add Suffix automates this task by using the file mappings assigned in the Internet control panel (or Internet Config in earlier versions of Mac OS) to choose the right extension according to each file's type and creator. If these mappings are already set up, you can simply install Add Suffix and put it to work.

The documentation for Add Suffix describes how to deal with multiple extensions mapped onto one type and creator code, but it illustrates the process using Internet Config rather than the Internet control panel. The former has a checkbox labelled Not for Outgoing, and you need to tick this box for all but one of the mappings for a particular type and creator. The Internet control panel has a box labelled Map Outgoing, so only one of the mappings should have this box ticked.

To add a new mapping to the Internet control panel, click the Advanced tab, then the File Mapping icon (in the scrolling list at the lower left), and then the Add . . . but-



▲ FileHierToClipCMPlugin determines the hierarchy within a folder and puts it on the clipboard.

ton. Type the extension you want to use, choose the application from the scrolling list and the file type from the pop-up menu. Click Show Advanced Options, and tick the Map Outgoing box. You may wish to enter a suitable description before clicking the Add button to save your new mapping.

Several developers have produced an equivalent to the Windows Open With contextual menu. Sometimes it can be convenient to open a document with a different application directly from the Finder. For example, a TIFF file might have been created with Photoshop, but if you just want to look at the image, it's much quicker to open it with PictureViewer.

OpenWith CMM automatically offers all the currently running programs, and other applications can be added to a permanent list if you Command-click them and select Add To Open List from the menu. Aliases for these applications are stored in the OpenWith CMM Items folder in the Preferences folder, and the Open Using menu can be made hierarchical by arranging those aliases within subfolders.

One limitation of OpenWith CMM is that it is not sensitive to the type of file selected: all the applications are shown, whether they can open the file or not. OpenUsing CMM's basic operation is similar to OpenWith CMM (aliases to applications are stored in the OpenUsing folder in Applications Support), but it can be configured to recognise particular file types.

To specify that PictureViewer and Photoshop should be offered for TIFF files, create a subfolder in the OpenUsing Folder, name it [,TIFF.tif.TIF] and place aliases for the programs in it. The square brackets around the name indicate that it is a type-sensitive list, where strings preceded by a comma are interpreted as Mac OS codes and those preceded by a full stop are interpreted as DOS extensions. If a document's type and extension are mismatched (for example, a JPEG file copied from a Windows PC over a LAN could have a JPG extension and the type TEXT), OpenUsing plays it safe and presents the applications matching the type *and* the extension. This makes OpenUsing fiddly to set up, but extremely useful.



▲ OpenUsing creates specially named folders containing aliases to applications used to open different files.

Whether you use OpenWith or OpenUsing (both freeware), useful applications to have in the menu include SimpleText, PictureViewer and your preferred word processor, graphics editor and Web browser, as well as any applications that you have aliased on the desktop for drag-and-drop launching. Add Script Editor to that list if you're an AppleScripter, and your favourite HTML editor if you create Web pages.

A shareware CMM called WithIt ($US15) automatically searches for applications and the types of file they can open, and obtains file mappings from Internet Config or the Internet control panel for documents with Windows extensions that are also type TEXT or an unknown type. This is a good idea, but we find the user interface inconvenient.

The CMMs mentioned here are all on the cover CDs this month, as are Calculate Size (total disk space occupied by selected items), CMScript (context-sensitive AppleScript launching), DeskPicChangerCM-Plugin (set the desktop picture to the selected graphic), FinderViewContextMenu (save and reapply Finder Views settings) and More File Info (view and change type and creator codes).

FinderPop

FinderPop adds to the contextual menu, but it is implemented as a control panel and provides other features. We'll concentrate on the contextual menu features, but read the manual to find out what else it can do.

FinderPop allows you to hold down the mouse button as an alternative to Ctrl-clicking. This is controlled by the Auto-Popup tab in the control panel. FinderPop also provides an Open With equivalent. Place aliases of your applications in the FinderPop Menu Items folder in the Preferences folder. These programs show up in the FinderPop contextual menu.

The Applications contextual menu lists all running applications, so you can switch to a different program without moving the mouse to the top-right corner of the screen. Press the Delete key, then click on an application to force it to quit — this can be useful for shutting down a background process.

The Windows menu allows you to switch between windows in the current application. The Desktop contextual menu allows you to open any item on your desktop, and you can drill down to three folder levels. This works more quickly than the Finder's 'click and a half' drill-down technique.

Have as few CMMs loaded as possible. The more that are active, the longer it takes the contextual menu to appear. Use Conflict Catcher or a similar utility to manage your CMMs.

Stephen Withers

Mac OS shareware

Iconata 1.0.5

This Mac OS X icon creator and editor provides previews of all icon elements and generates masks automatically.

iView MediaPro 1.0.5

A superior image management utility, this tool's features include advanced cataloguing, browsing and printing.

MP3 Rage 3.3

Arguably the definitive collection of tools for MP3 enthusiasts, Rage complements popular player applications.

PhotoStickies 1.0.1

No ordinary stickies, these can present floating images and live video streams as well as desktop pictures.



QuickDiaryX 3.0

A multifunction manager for address book data, memos, images, URLs and schedules.

All these programs and more can be found on this month's cover CDs, along with more detailed reviews.

For a complete archive of *APC* Mac OS columns, see apcmag.com.

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Handling large data files requires a means of identifying individual records.

Memory is made of this



In recent months, this column has described the various tasks involved in creating a class roll. In doing so, it has explored some of the intricacies of working with files. To keep things simple, our exploration has assumed that the entire data set could fit in memory. For many problems, this assumption holds true, but sometimes it does not.

What do you do when you need to manipulate a large amount of data? You might want to manage all class rolls for an entire university over a period of many years. Your data may contain thousands of records. Manipulating this data by reading and writing the whole data set would be at best slow and cumbersome, and at worst, impossible.

The solution is to read and write selected records; in particular, the records you wish to manipulate. To do this, you need to be able to locate particular records within a file. This can be done by *seeking*.

C++ streams use a tracking device called the *current position*. When you open a file, the current position is set at the beginning of the file by default. In this case, the current position is said to have an *offset* of zero. When you read or write data, the current position is advanced. A file stream can be an input stream, an output stream, or an I/O stream, which is capable of both input and output. An I/O stream has two current positions, one for reading and one for writing.

Moving the current position without reading or writing is known as *seeking*. If you want to read or write a particular record, you must compute its offset in the file and then seek to that position. The Read() function shown in listing 1 demonstrates this. The file is made up of a number of rec_t records. If recNo is zero, recNo*sizeof(rec_t) is also zero. This means you seek to the offset of zero (the first record in the file). If recNo is greater than zero, you seek into the file by the appropriate number of bytes. The record you want can then be read. Similarly, the Write() function seeks to a location in the file and then writes a record at that location. The two functions use different methods to seek. The seekg() method moves the input current position, and seekp() moves the output current position. The 'g' stands for 'get' and the 'p' for 'put'.

The second argument to the seekg() and seekp() methods indicates how the offset should be interpreted. This example uses std::ios::beg, which means seek to an offset from the beginning of the file. You can also use std::ios::end, to seek to an offset from the end of the file (presumably a negative offset), or std::ios::cur to seek from the current position. If you do not specify a second argument, it defaults to std::ios::beg.

C++ streams also have two extra methods — tellg() and tellp() — which return the current location. These can be useful in computing how far to seek.

Now you have almost enough theory to understand the next phase of the project, but one more piece is missing. When you add a record to the file, it may be necessary to seek past the end of the file. If the new record has an index that is larger than any previous record (which is likely), the seekp() method tries to seek beyond the end of the file, and fails. A seek function that can extend the file is required.

The CDataFile class (see listings 2 and 3) can be used for this purpose. It is a child class of the std::fstream class, so it inherits all of the functionality of that class. If it had no members other than a constructor, it would behave identically to the std::fstream class. However, it has one extra method: seekp(). This method overrides (replaces) the std::fstream.seekp() method. It has the ability to seek beyond the end of the file (and thus extend the length of the file).

This technique of extending or modifying a class while still retaining the majority of its functionality, is known as *specialising* the class. CDataFile is a specialisation of std::fstream.

The CDataFile constructor takes two arguments: a file name and an open mode. The second argument (open mode) is optional and a default value is given. This default is adequate for this project.

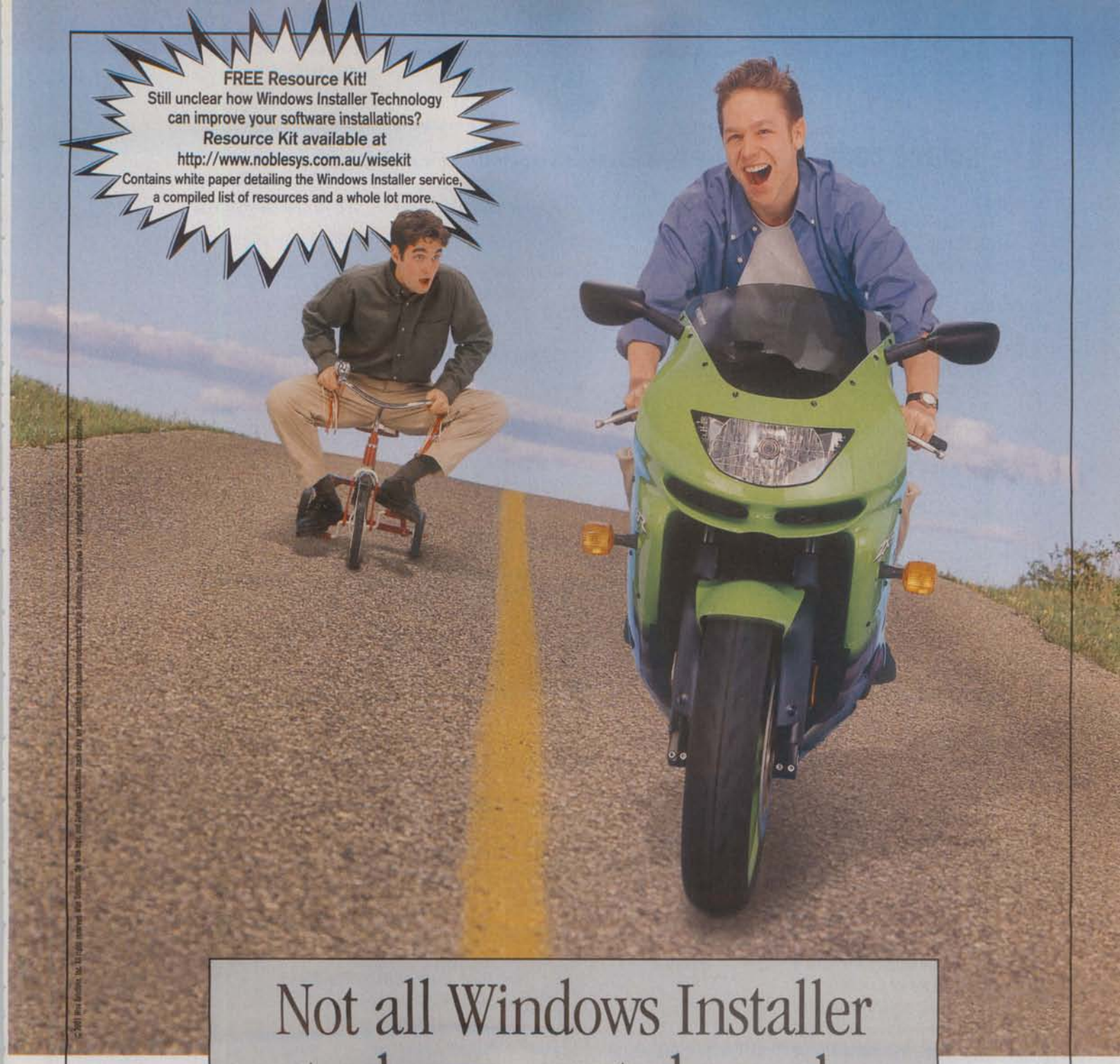
The CDataFile constructor passes the file name and open mode to the base class constructor, which then attempts to open the file. See 'Funny template names' for why the base class constructor is referred to as std::basic_fstream<char>(), rather than the more obvious std::fstream(). If the file does not open correctly, it is presumed that it does not exist. An extra flag is added to the open mode, std::ios::trunc, which allows the file to be created. A second attempt is then made to open the file. This extra flag is unsuitable if the file exists, as it will truncate the file (discard all the data).

The specialised seekp function begins by casting the 'this' pointer to the base class, std::fstream. 'this' points to the current object — in this case, a CDataFile object. By casting it to the base pointer, you can use it to access the std::fstream.seekp() method. All of the other std::fstream methods, such as clear() and write(), are inherited from the base class, so they can be used in the normal manner. However, because this class contains a specialised version of the seekp() method, it prevents you from accessing the base class version of seekp(), unless you do so explicitly using a base class pointer.

Funny template names

Most classes you are likely to use are from the STL (Standard Template Library). These templates allow a great deal of flexibility and power in dealing with a wide variety of data types, but one cost of this is that the names can become rather complex. What you commonly refer to as std::fstream is really known as std::basic_fstream<char>. This is a basic file stream, specialised for normal ASCII character data, as opposed to wide character (Unicode) data. The name std::fstream is an alias, set up to make it easier to use.

Unfortunately, when you specialise this class, you need to refer to the constructor by its long name, std::basic_fstream<char>(), rather than the more obvious std::fstream(). The alias refers to the class, not the constructor.



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C++ source code

Note: Text that appears in italics is explanation only, not code.

Listing 1

```
bool Read(std::ifstream &fs,
          int recNo,
          rec_t &rec)
{
  int offset = recNo*sizeof(rec_t);
  fs.seekg(offset, std::ios::beg);
  fs.read(reinterpret_cast<char *>(&rec),
      sizeof(rec_t));
  return fs.good();
}
bool Write(std::ofstream &fs,
           int recNo,
           rec_t &rec)
{
  int offset = recNo*sizeof(rec_t);
  fs.seekp(offset, std::ios::beg);
  fs.write(reinterpret_cast<char *>(&rec),
      sizeof(rec_t));
  return fs.good();
}
```

Listing 2: DataFile.h

```
#include <fstream>
class CDataFile : public std::fstream
{
public:
  CDataFile(const std::string &fname,
        std::ios::openmode mode=
          std::ios::binary|
          std::ios::in|
          std::ios::out);
  CDataFile&
    seekp(std::ios::pos_type pos);
};
```

Listing 3: DataFile.cpp

```
#include "DataFile.h"
CDataFile::CDataFile(
    const std::string &fname,
    std::ios::openmode mode)
: std::basic_fstream<char>(fname.c_str(),
                           mode)
{
  if (!is_open()) {

    // The file doesn't exist; you need to change mode so it
    // will be created.

    mode |= std::ios::trunc;
    open(fname.c_str(), mode);
  }
}
CDataFile& CDataFile::seekp(pos_type pos)
{

  // Cast this class to its base class.

  std::fstream *fsPtr =
    reinterpret_cast<std::fstream *>(this);

  // Try to seek to the position.

  fsPtr->seekp(pos);
  if (fail()) {

    // Clear the fail flag.

    clear();

    // Seek to end of file.

    fsPtr->seekp(0, std::ios::end);

    // Compute the offset from here to the desired position.

    pos_type endpos = tellp();
    pos_type offset = pos - endpos;

    // Write zeros to extend the file. This will set the position to
    // the correct location.

    char *buff = new char [offset];
    memset(buff, 0, offset);
    write(buff, offset);
    delete [] buff;
  }
  return *this;
}
```

All these listings can be found on this month's cover CDs.

The specialised seekp() method tries to perform a normal seek using the base class's seekp() method. If that succeeds, no further action is required. It calls the fail() method (inherited from the base class) to test whether the seek operation has failed.

If the original seek fails, you can conclude that you are trying to seek past the end of the file, and that the specialised code is needed. First, call clear() to clear the fail flag. Next, seek to the end of the file, and use the tellp() method to determine the current position and compute the new offset (how far the file needs to be extended). Allocate a buffer and fill it with zeros using memset(), then write the zeros to the file — thus extending the length of the file. It is not necessary to seek to the end of the file, as the write operation moves the current position.

Next month, find out how to apply the new CDataFile. Until then, keep on coding!

Michael Smith

For a complete archive of *APC* C++ columns, see apcmag.com.

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Continue to explore abstract data types with two new classes.

Exploring vectors

The Java language provides arrays (see *APC* April, page 142), which allow you to store many values into a single named variable, each value referenced by an index; for example, CountryNames[50].

However, arrays cannot grow or shrink once they have been created. So if you want to use an array to store data, but do not know in advance how many elements you will need to store, you run the risk of either making your array too big, which wastes memory, or too small, which is worse, as it cannot store all your data.

One of the standard Java classes that comes with any version of the Java JDK or other development environments is java.util.Vector. An object of the Vector class is an array which can grow or shrink as needed. This means it can accommodate adding and removing items after the vector object has been created.

Two important terms when discussing vector objects are capacity and capacityIncrement. Capacity specifies how many objects can be stored in the vector object at its current size, and is always at least as large as the number of objects stored in it. If the vector is at its capacity, it increases in chunks the size of capacityIncrement.

A vector does not impose any order on the elements that are placed in it, nor does it care if duplicate values are inserted. The Vector class is a utility class, and it is up to the programmer to make use of it.

The vector object provides many methods, including techniques for adding and deleting objects.

- addElement(Object) adds the specified object to the end of a vector, increasing its size by one.
- removeElement(Object) removes the first occurrence of the argument from this vector.
- removeElementAt(int) deletes the object at the specified index.
- capacity() returns the current capacity of a vector.
- contains(Object) tests if the specified object is a component in this vector, and returns either true or false.
- elementAt(int) returns the object at the specified index.
- elements() returns an enumeration of the objects of this vector.
- firstElement() returns the first object of this vector.
- insertElementAt(Object, int) inserts the specified object as a component in this vector at the specified index.
- isEmpty() tests if a vector has no components, returning either true or false.
- lastElement() returns the last component of the vector.



Hashtables

Objects of the java.util.Hashtable class are a little more complicated than objects of the Vector class. Fortunately, JavaSoft programmers have already done most of the work. A hashtable is also used for managing collections of objects, but it stores object references by mapping keys to values. Any non-null object can be used as a key or a value.

Objects used as keys in a hashtable must implement the hashCode() method. This is a method that converts an object into a unique identifier by applying a mathematical algorithm to the object. It is a method in the Object class, from which every other class derives; hence a default version is inherited by all classes in Java.

Many of the classes in the standard Java API override the hashCode() method for objects of that class to provide a relevant implementation for that class. This includes the String class.

Similarly, objects used as keys in a hashtable must implement the equals() method. This method is also defined in the Object class and overridden by many classes (including String) in the Java library.

- contains(Object) tests if a key maps into the specified value in this hashtable, returning either true or false.
- containsKey(Object) tests if the specified object is a key in this hashtable, returning either true or false.
- elements() returns an enumeration of the values in this hashtable.
- keys() returns an enumeration of the keys in this hashtable.
- get(Object) returns the value to which the specified key is mapped in this hashtable.
- isEmpty() tests if this hashtable doesn't map any keys to values, returning either true or false.
- put(Object, Object) maps the specified key to the specified value in this hashtable.

When you want to store an object in a hashtable, you provide two objects. One is used as a key and the other is stored as a value. To retrieve the object that has been stored, you simply provide the key again, and the code in the method retrieves and returns the object that was stored as a value. As with Vector, there are quite a few methods to help you use hashtables.

All value objects in Vector and Hashtable classes belong to the generic type Object, which means you can use them to store data of any type.

This means references to objects can be stored in a vector or a hashtable. In the sample program this month, references to objects that contain instance methods will be stored. They will then be retrieved to invoke the instance methods contained in the objects.

This program is not intended to accomplish anything other than to illustrate how to use the Vector and Hashtable classes, and the Enumeration interface. It also illustrates some other important Java programming concepts, such as registering a list of objects for a particular purpose, processing all the objects on the list of registered objects, and working at a generic object level.

David Williams

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For a complete archive of *APC* Java columns, see apcmag.com.

Java source code

Listing 1: sample.java

```
import java.util.*;
class sample
{
  public static void main (String[] args)
  {
    CompareManager compareManager = new CompareManager ();
    Data Tom = new Data ("Tom", 30, 85);
    Data Dick = new Data ("Dick", 40, 75);
    Data Harry = new Data ("Harry", 50, 65);

    compareManager.registerPair (Tom, Harry);
    compareManager.registerPair (Tom, Dick);
    compareManager.registerPair (Dick, Harry);
    compareManager.compareAll ("AGE");
    compareManager.compareAll ("WEIGHT");
  }
}
class Data
{
  String name;
  int age;
  int weight;
  Data (String name, int age, int weight)
  {
    this.name = name;
    this.age = age;
    this.weight = weight;
  }
}
interface Comparable
{
  public void comparePair (String how, Object obj1, Object obj2);
}
class CompareManager
{
  Object compareTool;
  Vector myListOfObjects;
  class PairOfObj
  {
    Object obj1;
    Object obj2;
    PairOfObj (Object obj1, Object obj2)
    {
      this.obj1 = obj1;
      this.obj2 = obj2;
    }
  }
  CompareManager ()
  {
    this.compareTool = new CompareTool ();
    myListOfObjects = new Vector ();
  }
  public void registerPair (Object obj1, Object obj2)
  {
    this.myListOfObjects.addElement (new PairOfObj (obj1, obj2));
  }
  public void compareAll (String how)
  {
    Enumeration myEnum = myListOfObjects.elements();

    while (myEnum.hasMoreElements ())
    {
      Object aPairOfObj = myEnum.nextElement();
        ((Comparable) compareTool).comparePair (how, ((PairOfObj)
aPairOfObj).obj1, ((PairOfObj) aPairOfObj).obj2);
    }
  }
}
class CompareTool implements Comparable
{
  private Hashtable myHashTable = new Hashtable ();
  private class AgeCompare implements Comparable
  {
    public void comparePair (String how, Object obj1, Object obj2)
    {
      System.out.println ("In AgeCompare method");
      Data temp1 = (Data) obj1;
      Data temp2 = (Data) obj2;
      if (temp1.age < temp2.age)
          System.out.println (temp1.name + " is younger than " +
temp2.name);
      else
          System.out.println (temp2.name + " is younger than " +
temp1.name);
    }
  }
  private class WeightCompare implements Comparable
  {
    public void comparePair (String how, Object obj1, Object obj2)
    {
      System.out.println ("In WeightCompare method");
      Data temp1 = (Data) obj1;
      Data temp2 = (Data) obj2;
      if (temp1.weight < temp2.weight)
          System.out.println (temp1.name + " is lighter than " +
temp2.name);
      else
          System.out.println (temp2.name + " is lighter than " +
temp1.name);
    }
  }
  public CompareTool ()
  {
    myHashTable.put ("AGE", new AgeCompare());
    myHashTable.put ("WEIGHT", new WeightCompare());
  }
  public void comparePair (String how, Object obj1, Object obj2)
  {
    if (myHashTable.containsKey (how))
    {
      Object theMethod = myHashTable.get (how);
      ((Comparable) theMethod).comparePair (how, obj1, obj2);
    }
    else
      System.out.println ("Invalid Key.");
  }
}
```

This listing can also be found on this month's cover CDs.

Navigation using Flash cookies can add dynamic content to your site.

Taking the biscuit

This month, Insite looks at incorporating dynamic Flash content into your site using JavaScript. The concept behind this is that a Flash menu bar creates a JavaScript variable, which is detected in another frame that hosts an animated Flash header. The text content of the Flash header is taken from this variable.

As the dynamic content is generated by Flash and transmitted by JavaScript, no server-side scripting is required. Therefore, this technique will work with regular HTML files. Hopefully, it will also indicate how the use of server scripting can further enhance Flash-based content, whether you use Perl, ASP, PHP or ColdFusion.

What's involved?

Because you're dealing with frames, you need one frameset definition page (index.html) with two frames. Additionally, you need a menu bar page (menu.html) and a page for each link in the menu. For the sake of simplicity, you can start with a single page (main.html) for all the menu items until the Flash content is up and running. (All of the example HTML and Flash files are included on the cover CD.)



The menu page will contain the menu bar Flash movie and a single, simple JavaScript function. The main page will contain the header Flash movie, which is used for all subsequent pages, as well as another basic JavaScript function and any other HTML content specific to the document.

First, open a new file in Flash and create a few buttons to use in your menu. The example consists of three buttons: about, contact and search. These can sit together in a single layer, as no animation is required. Put a Stop() ActionScript in the first frame to stop the movie.

Next, give each button an 'On (Release)' action of GetURL, as shown in figure 1. Instead of using a regular URL for this action, it will execute a JavaScript function on the menu.html page called SetTitle(). Some sample GetURL functions for the three buttons are shown in listing 1. These demonstrate how to pass the two necessary variables to our customised JavaScript function. The first parameter contains the text to be displayed in the animated Flash header in one frame. The second parameter contains the URL of the page that is to be loaded into the other frame. Since the JavaScript function will be located in the same frame as the Flash movie, '_self' is used as the target for the GetURL function.



At this stage, you can save the Flash file as menu.fla and publish it to create the menu.swf and menu.html files (see examples on the CD).

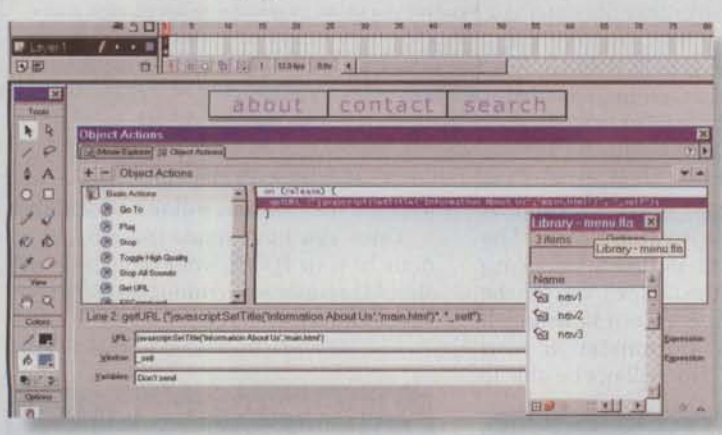
Now create another Flash movie and add a single text field in layer 1. Convert this text to a symbol (F8) and create a keyframe at frame 20 (F6). Set the alpha level at frame 1 to 0% in the Effect Panel, and then set the alpha level to 100% in frame 20. Next, create a motion between these two keyframes.

You can put anything you like into the text field, as the text will be replaced when the page is loaded. In order to make this replacement possible, you will need to modify the settings for the text field to Dynamic Text and Single Line. Additionally, give it the Variable name 'title'. You may also want to embed the fonts by selecting the [...] button. These settings are shown in figure 2.

To finish the movie, simply add a Stop() action to frame 20. Now you can save this as main.fla and publish main.swf and main.html to the same folder that you used for the menu bar.

The JavaScript functions

In the menu.fla Flash movie, a GetURL action is employed to execute a JavaScript



▲ Figure 1: Each button is given an object action.



▲ Figure 2: Setting up the dynamic text field for the header.

Insite source code

Listing 1: The ActionScript for the three buttons

```
getURL ("javascript:SetTitle('Information About Us','info.html')",
"_self");
getURL ("javascript:SetTitle('How to Contact Us','contact.html')",
"_self");
getURL ("javascript:SetTitle('Search Our Site','search.html')",
"_self");
```

Listing 2: The JavaScript for menu.html

```
<script>
<!--------------------------
title="Welcome";
function SetTitle(value,url){
        title = value;
        top.main.location=url;
}
//-------------------------->
</script>
```

Listing 3: The JavaScript for main.html

```
<script>
<!--------------------------------------
function setHeader(){
                newtitle = parent.menu.title;
                header.SetVariable('title', newtitle);
}
//-------------------------------------->
</script>
```

Listing 4: The BODY and OBJECT tags for menu.html

```
<BODY bgcolor="#FFFFFF" OnLoad="setHeader()">
<OBJECT
 classid="clsid:D27CDB6E-AE6D-11cf-96B8-444553540000"
 WIDTH=550 HEIGHT=30 ID="header">
 <PARAM NAME=movie VALUE="main.swf">
 <PARAM NAME=quality VALUE=high>
 <PARAM NAME=bgcolor VALUE=#FFFFFF>
 <EMBED src="main.swf" quality=high bgcolor=#FFFFFF
 WIDTH=550 HEIGHT=30 TYPE="application/x-shockwave-flash">
 </EMBED>
</OBJECT>
```

For the complete code for all the pages used here, check this month's cover CD.

function called SetTitle(). This is shown in listing 2. It is a very simple script that takes two parameters. The first line takes the first parameter and assigns it to a variable called title. The second line takes the second parameter and instructs the frame called main to load the URL contained within it.



▲ Figure 3: The default text for the header movie on the main.html page.

Prior to the definition of the SetTitle function, the title variable is set to "Welcome". This will be the default text for the header movie when the main.html page is initially loaded. If the page is called from the SetTitle() function, it will be reset immediately. If the page is called from elsewhere (for example, the index.html frameset), it will display the default text, because the SetTitle() function will not be executed. This is shown in figure 3.

Listing 3 shows the JavaScript setHeader() function required by main.html and any other documents in your site that will include the main.swf Flash movie. It is called by the BODY OnLoad event. The first line sets a variable called newtitle to the current value of the title variable in the menu frame. Next, it tells the header Flash object to set the value of its title variable to this value. The header object is defined by using ID="header" in the OBJECT tag for the Flash movie. This is shown in listing 4. Without this ID parameter in your HTML, the JavaScript will not be able to communicate with the Flash movie, and thus the text content will not be updated.



▲ Figure 4: The results of your index.html file.

Once you have made these modifications to your HTML, your index.html file should produce something like the screenshot in figure 4.

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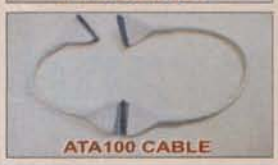

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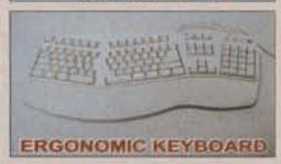

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Acer 771 17", .27 1280x1024 60Hz	$384
Acer 99si 19", .26 1800x1200 75Hz	$755
Acer 211C 21", .26 1800x1200 75Hz	$1,663
Hitachi CM615 17", .24 1280x1024	$376
Hitachi CM625 17" (Flat Trinitron)	$477
Hitachi CM715 19", .22 1600x1200	$740
Hitachi CM772 19", .22 1800x1350 (Flat)	$865
Hitachi CM811+ 21", .22 1600x1280	$1,039
Hitachi CM813+ 21", .22 1600x1280	$1,768
LG SW775N Studioworks 17"	$366
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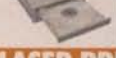
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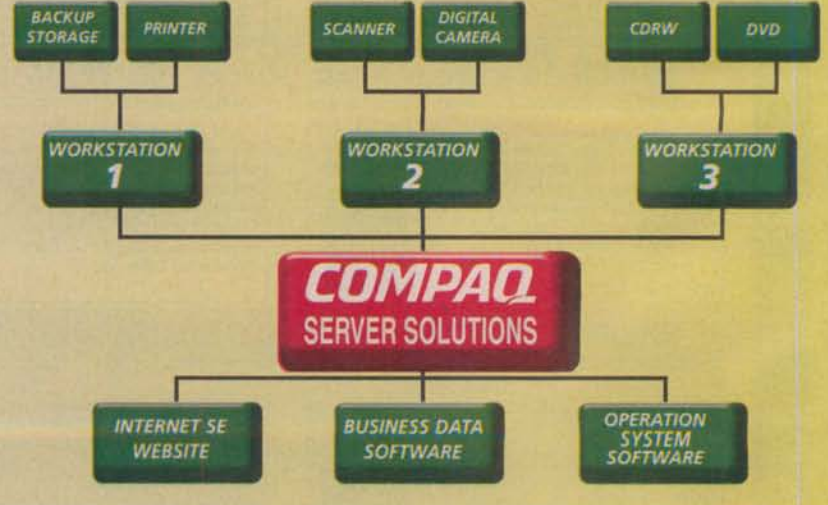
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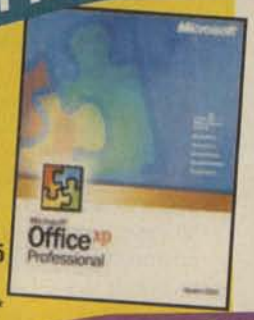
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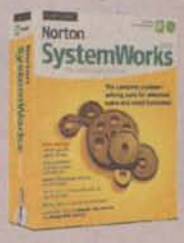
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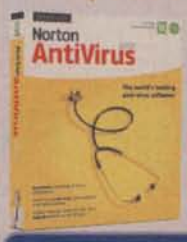




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- 3D Audio, Stereo Speakers
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- Intel Pentium 866MHz CPU
- 128MB SDRAM PC-133
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- Sound Blaster Live Value r
- **600W Speaker with Subwoofer**
- Acer Multimedia Keyboard
- Microsoft Window Me

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***Bonus:** Free 16x DVD ROM

Lantrix PX P1500

- Intel Pentium 4 1.5GHz CPU
- 256MB SDRAM PC-800
- **20GB ATA/100** Hard Disk
- 32MB nVidia TNT2 M64 AGP
- Sound Blaster Live Value
- **600W Speakers with Subwoofer**
- Acer Multimedia Keyboard
- Microsoft Window Me

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***Bonus:** Free 16x DVD ROM

Lantrix PX A1000

- AMD Athlon 1000MHz CPU
- 256MB SDRAM PC-133
- **20GB ATA/100** Hard Disk
- 32MB nVidia TNT 2 M64 AGP
- Sound Blaster Live Value
- **600W Speakers with Subwoofer**
- Acer Multimedia Keyboard
- Microsoft Window Me

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- Sound Blaster Live Value
- **600W Speaker with Subwoofer**
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CJC012K	2xCart	Canon BJC-70 - Black/Colour Cleaning Kit
CJC400K	2xCart	Canon BJC 4000/4100/4200 - Black/Colour Cleaning Kit
CJC600K	4xCart	Canon BJC 600/610/620 - Black/Colour Kit
CJE541B	1xCart	Epson Stylus Colour pro, PROXL, PROXL+ - Black
CJE542C	1xCart	Epson Stylus Colour pro, PROXL - Tri-Colour
CJE551B	1xCart	Epson Stylus Colour II's, 820, 200 - Black
CJE552C	1xCart	Epson Stylus Colour II, II's, 820, 200, 500 - Colour
CJE561B	1xCart	Epson Stylus Colour 400, 440, 460, 500, 600, 640 Photo, 660, Photo 700, Photo750, Photo 1200, Photo Ex. - Black
CJE571B	1xCart	Epson Stylus Colour 740,760,800,850,860,1160,1520, Scan2000, Scan 2500, Scan 2500 Pro - Black
CJE572C	1xCart	Epson Stylus Colour 400,440,460,600,640,660,740, 760,800,850,860,1160,1520, Scan 2000, Scan 2500, Scan 2500 Pro - Tri-Colour.
CJE584C	1xCart	Epson Stylus Colour 300 - 4 Colour
CJE585C	1xCart	Epson Stylus Photo, Photo 700, 750/EX - 5 Colour
CJK000	1xKit	Cleaning Kit for Hewlett Packard & Lexmark Inkjet printers

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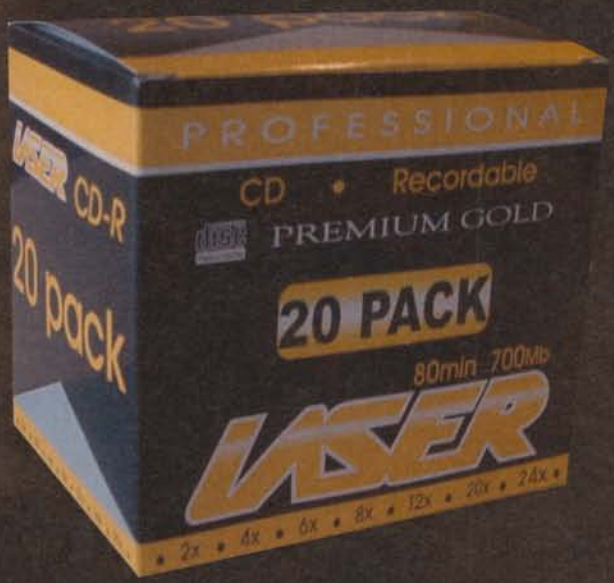
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HP Desk Jet 710/720/890/900 Series	3x3	30B-CLR
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EPSON Stylus 820/colour II/IIs	3x12	24-CLR
EPSON Stylus Colour 200/300/400/500/600/800/850/1520	3x12	34A-CLR
EPSON Stylus Colour 440/460/480/640/660/700/740/760/900	3x12	34B-CLR
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HP DESKJET 710/720/750/870/880/890/893 & MORE	6	K3BK	6	K22CLR
CANON BJ-30 / BJ50 / BJC70 / BJC80	60	K7BK	30	K1CLR
CANON BC-01 / BC-02 / BCO3/ BX3/ BC-05/ BJ10E/BJ200/BJC210/240/255sp plus more	6 or 8	K8BK/K4BK	8	K2CLR
CANON BJ300/BJ330	7	K9BK		
CANON BC20/BC121C/2000/4000/4100/4200/4310/4550 & BC-22 photo kit	6 0r 60	K12BK	30	K5CLR / K18CLR
CANON BJC600/810/620	12	K10BK	6	K3CLR
CANON BJC800/820/880	8	K11BK	6	K4CLR
CANON BJC5000/5100/5500/BC-23 (PIGMENT) BC121C Ask about 6200	6	K27BK	30	K5CLR
CANON BJC-6000/BJC-3000/BJC-6500/BC-30/BC-31	12	K28BK	6	K35CLR
CANON BJC-6000 PHOTO KIT / BC-32 ask about 3000 photo kit			6	K36CLR
CANON FLUERESCENT BC-29F			6	K21CLR
CANON BJC-7000/7100/BC-60/OPTIMISER INK/BC-161	2	K19BK	6	K24CLR
CANON BJC-7000/BJC-7100/BC62/ PHOTO KIT			6	K15CLR
CANON BJC-8200/BCI-5BK/BCI-5M/BCI-5Y/BCI-5Y Photo	12	K33BK	6	K39CLR
EPSON SMART CHIP PRINTERS 670, 777, 870, 880, 890, 1270, 1280 PHONE FOR KIT CODE	12		6	
EPSON STYLUS COLOR 800 /1520	12	K13BK	6	K29CLR
EPSON STYLUS 800/800+/1000/400/300	12	K14BK	6	K6CLR
EPSON COLOR/COLOR PRO/XL SERIES	12	K15BK	6	K8CLR
EPSON STYLUS COLOR 300 FOUR COLOR KIT			6	K33CLR
EPSON STYLUS 200/COLOR11/11S SERIES, 820	12	K16BK	12	K8CLR / K7CLR
EPSON COLOR STYLUS 400/600 SERIES	12	K17BK	12	K20CLR
EPSON STYLUS COLOR 440/460/640/660/670	12	K26BK	12	K16CLR
EPSON COLOR 740/750/760/860/880/1160/1200 Bk only	12	K6BK	12	K16CLR
EPSON STYLUS COLOR 900/T-003/T-005	12	K29BK	12	K37CLR
EPSON STYLUS COLOR 500	12	K17BK	12	K8CLR
EPSON COLOR 3000/5000 1 X KIT PER COLOR	3	K21BK	3	K34CLR
EPSON STYLUS COLOR 480/580/T-013/T-014	12	K31BK	12	K40CLR
EPSON STYLUS PHOTO 700/EX700/720/750/1200	12	K17BK	12	17CLR
LEXMARK/IBM4076/1020/2030/2050/2070/1000/1100	6	K24BK	12	K13CLR
LEXMARK/IBM/2030/2050/ PHOTO			12	K29CLR
LEXMARK 3200/5700/5770/7000/7200/Z11/Z31waterproof	6	K25BK	12	K30CLR
LEXMARK 3200/5700/5770/7000/7200 photo(bk w/proof)	6	K25BK	12	K32CLR
LEXMARK Z12 / Z22 / Z32 (black-waterproof)	6	K25BK	12	K30CLR
LEXMARK Z42 / Z51 (black-waterproof)	6	K25BK	12	K41CLR
BROTHER MFC-7150 / 7160) LC02BK / M/C/Y)	6	K30BK	6	K38CLR
SAMSUNG M10 SERIES	10	K25BK	12	K30CLR
OLIVETTI JP 150/250/350/380/450/OFX2035/3100	6	K20BK	6	K19CLR
CLEANING KIT - Hewlett Packard, Canon, Lexmark only		K1Z		

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CANON BJC-600 2 X Y / M / C	4096	$13.00
CANON BJC-600 HI - CAPACITY	4097K	$8.90
CANON BJC-800 Black / yellow / cyan / mag	2290	$14.30
CANON BJC-4000	4136K	$9.90
CANON BJC-4000	4152A	$13.90
CANON BJC-6000	3487K	$16.90
CANON BJC-6000 magenta / cyan/ yellow	3487	$11.90
CANON BJC-6000 Photo blk / C / M	3488P	$21.90
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EPSON STYLUS COLOR II / 820	4237K	$12.00
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CANON BJC2000/4000/4200/4550 BCI-21/20	50/8	C8
CANON BJC 3000/6000/6500	6	C19
CANON BJC 7000/7100	6	C15
HP DESKJET 400, 500 & 600 SERIES	7	H2/H4
HP DESKJET 700/800/900/1100/1200 SERIES	6	H13
HP DESKJET 1200 B, Y, C, M	6	H8
EPSON STYLUS COLOUR 750/900/1200	12	E#
EPSON STYLUS 400/800/1000	8	E1
EPSON STYLUS COLOUR / PRO / XL	6	E2
EPSON STYLUS 820 / COLOUR 11/11S/200	12	E4
EPSON COLOUR 400/500/600/700/Photo Ex	12	E7
EPSON COLOUR 440/640/740/800/850/1520	12	E7
EPSON STYLUS COLOUR 750/900/1200	12	E14
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CANON BJC210/BJC210sp/BJC255sp	12	C3
CANON BJC600/610/620	8	C6
CANON BJC4000/4100/4200/4550 BCI-21	30	C9
CANON BJC 7000/7100	6	C16
HP DESKJET 400, 500 & 600 SERIES	12	H3/H5
HP DESKJET 700/800/900/1100/1200 SERIES	7	H14
EPSON STYLUS COLOUR / PRO / XL	6	E3
EPSON STYLUS 820/COLOUR/11/11S	12	E5
EPSON COLOUR 200/400/500/600/800/1520	12	E8/E9
EPSON COLOUR 440/480/580/640/740	12	E9
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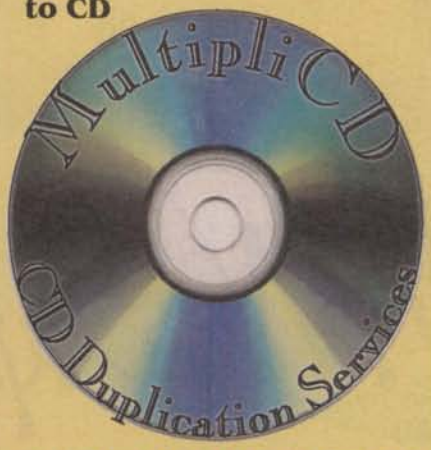
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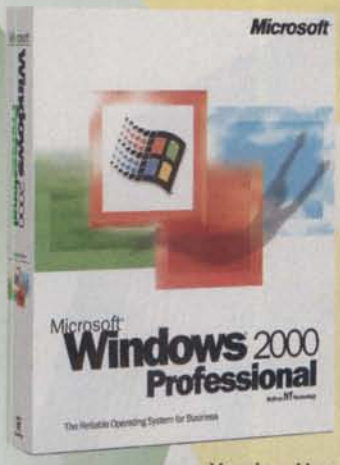
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Satellite	1800	1800
PROCESSOR	Celeron 800MHz	PIII 850MHz
RAM STD	64 MB	64 MB
HARD DRIVE	10 GB	15 GB
SCREEN	13.3" TFT	13.3" XGA
CD-ROM/DVD	CD	DVD
PORT REPLICATOR	No	No
VIDEO RAM	8 MB	8 MB
56K v9.0 & 10/100 LAN	56 K	56 K/Eth
WARRANTY	1 Year	1 Year
Rent*	$27.41	$34.22
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	(C6016)	(C5251)



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Satellite 3000

Satellite	3000
PROCESSOR	PIII 850MHz
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HARD DRIVE	15 GB
SCREEN	14.1" TFT
CD-ROM/DVD	DVD
PORT REPLICATOR	No
VIDEO RAM	16 MB
56K v9.0 & 10/100 LAN	56 K/Eth
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	(C5254)



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HARD DRIVE	15 GB	15 GB	20 GB	30 GB
SCREEN	14.1" TFT	14.1" TFT	14.1" TFT	15.0" TFT
CD-ROM/DVD	DVD	DVD	DVD	DVD
VIDEO RAM	8 MB	16 MB	16 MB	16 MB
56K v9.0 & 10/100 LAN	56k/Ethernet	56k/Ethernet	56k/Ethernet	56k/Ethernet
WARRANTY	1 Year	1 Year	1 Year	1 Year
Windows '98	(C4238)	(C5940)	(C5924)	(C5941)
GST INC	**$3,789**	**$4,569**	**$4,969**	**$5,679**
Rent*	$37.16	$42.70	$45.29	$51.76
Windows NT/2000	(C4239)	(C6712)	(C5942)	(C6714)
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CD-ROM/DVD	8 x DVD	8 x DVD / CDRW
PORT REPLICATOR	Optional	Optional
VIDEO RAM	16MB	16MB
56K v9.0 & 10/100 LAN	Yes/Wireless	Yes/Wireless
WEIGHT	2.8 kg	2.8 kg
WARRANTY	3 Years	3 Years
OP System	Win 98	Win 98
Rent*	$60.63	$78.36
GST Inc	**$6,988**	**$9,178**
	(B8636)	(B8638)
OP System	Win NT/2K	Win NT/2K
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Portege	3490CT
PROCESSOR	PIII 700MHz
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DISPLAY	1024x768
CD-ROM	Optional
MIC & SPEAKER	Yes
SELECT BAY	No
56K v9.0	Yes
LAN	Yes
DVD CAPABLE	Yes - optional
WEIGHT	2 kg
WARRANTY	3 Years
OP System	Win 98
Rent*	$43.38
	$4,642
	(B8629)
Win NT/2K	$45.13 (Rent*)
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Projectors

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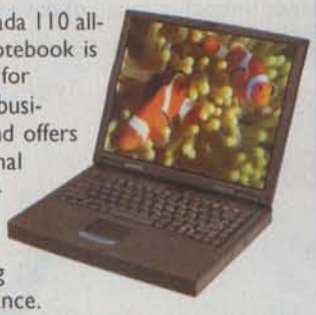
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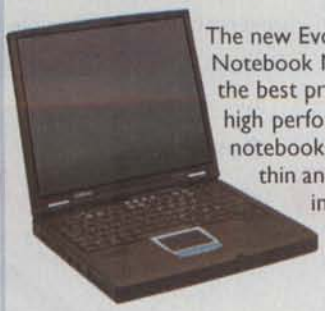
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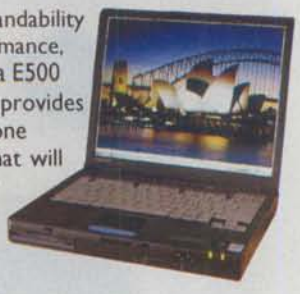
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- Removeable 8x DVD-ROM Drive
- Integrated Modem and 10/100 Ethernet
- Microsoft Windows ME
- 1 Year Limited International Warranty, including pick-up in Australia*

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- Microsoft Windows 98 SE
- 1 Year Limited International Warranty, including pick-up in Australia*

(C2140) GST INC: **$5,095**

Rent: $46.44/wk



HARRIS TECHNOLOGY for all your computer needs!

* Includes pick-up from anywhere within Australia, with a 48-hour service workshop turnaround repair time.

COMPAQ Microportable Projectors

Australian Government Endorsed Supplier Supporting Australian Business

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COMPAQ MP1400

- 800 x 600 SVGA native display resolution and auto scales up to XGA and Macintosh resolutions
- Increased light output of 700 ANSI lumens
- On-screen menu or adjusting tint, brightness, colour and many more image settings
- Operating noise less than 40 decibels
- Optional remote control/multimedia adapter with 8W Premier Sound speaker and video plug of VCR, DVD and camcorder inputs
- Only 1.9kgs
- 2 year warranty



(A5430) GST Inc

$5,790

Rent $52.77/wk

COMPAQ MP2800 – NEW!

- 1024 x 768 XGA display resolution
- Increased light output of 1000 ANSI lumens
- On-screen menu or adjusting tint, brightness, colour, keystoning and many more image settings.
- Remote control/multimedia adapter with 8W
- Premier Sound speaker and video plug or VCR, DVD and camcorder inputs, USB compatible, DVI connector
- Operating noise levels less than 40 decibels
- Integrated zoom lens
- Only 1.36kgs
- 2 year warranty



(B8669) GST Inc

$9,179

Rent $78.37 /wk

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COMPAQ

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Complete Business Networking Solutions

New Generation Compaq Proliant ML370 Server: Now in a class of its own!



ProLiant ML 370 G2

For unprecedented performance and availability!

When it comes to performance, availability and versatility, the new Compaq ProLiant ML370 server redefines the two-way server class!

- Ensures constant uptime with Hot pluggable Hard drives, cooling fans, PCI slots (2), and also optional Hot Plug secondary power supply. The all-new Compaq online spare memory.
- Dual Capable Pentium III 1133MHz Flip Chip PGA system with 512k on die cache and 133MHz FSB
- 256MB of 133MHz ECC registered SDRAM memory (expandable to 6GB)
- Integrated Dual Channel Ultra 3 SCSI Controller
- 6- 1" Hot PLug Hard drive bays, 6 - 64bit PCI slots

Includes:

- New Compaq Smartstart Version 5.1 and Compaq Insight Manager Software
- Pre-failure warranty on Hard drives, processor and SDRAM
- 3 Year on Site, Next Business Day, Compaq Warranty

(C7879) GST INC: **$5,899** Rent: $54.20/wk

RENTSMART
SEE PAGE 64 FOR MORE DETAILS
The figures quoted are based on a per week basis over 3 years. T.A.P, Terms & Conditions apply.

ProLiant ML 370R G2 - Rack (C7880) GST INC: $6,599 Rent: $57.33/wk

Compaq Wireless LAN Series

Networking is an ideal solution when you need to share devices, files or an Internet connection. Compaq's Wireless LAN Products make networking simple. You save time and money as you can install it yourself in just minutes. There is no need to fuss with wiring and you can add users, as you need to buy simply adding extra client cards.

Whether you're a small office or a home office, needing to share Internet access is simple and easy. The Compaq WL310 SOHO Gateway comes with an in-built 56K modem line, so you can plug in to the Internet and share your connection.

For medium sized businesses wireless networks eliminates cost to "wire" the office. Now you can share network peripherals, file and Internet access. Wireless LAN's are flexible and scalable so they can grow as your needs grow.



Access Points

Strategically position the Hardware Access Points around the office and remain connected to the network as you move from one end of the office to another.

WL310 SOHO Gateway
191813-011 (C3297) GST INC: **$732**

WL410 SMB Access Point
191811-011 (C3298) GST INC: **$1,285**

WL510 Enterprise Access Point
216709-011 (C3299) GST INC: **$1,837**

Client Cards

Install either a PC Card (for notebooks) or a PCI (for desktop PC's) or a USB* (notebooks or desktops) in each device connecting to the network

WL110 PC Card
191808-B21 (C3294) GST INC: **$273**

WL210 PCI Card
191809-B21 (C3295) GST INC: **$395**

WL215 USB Client
191810-B21 (C3296) GST INC: **$319**

*To use USB Client, device must be running Windows 98 or Windows 2000.

Ask About...
EXTENDED HARRIS TECHNOLOGY WARRANTY
- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

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HARRIS TECHNOLOGY @ Kmart

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HP Networks & Servers

NEXT BUSINESS DAY ADVANCE REPLACEMENT - LIFETIME WARRANTY
****PLEASE NOTE THAT PRICES ARE SUBJECT TO CHANGE ON ALL PRODUCTS****

HP ProCurve Switch 2512 & 2524



9.6GBPS BACKPLANE & AUTO-MDI/-X! • Lowest Price 10/100 Managed Switch • Provides a rich, layer 2 feature set • Includes 2 built-in gigabit transceiver slots • Auto MDI/-X on all 10/100 and 100/1000 ports • Lifetime warranty for as long as you own the product • Wire-speed performance on all ports • FREE HP TopTools Management Software included

2512 (12 port managed switch)
(A9703) GST Inc: **$1,619**

2524 (24 port managed switch)
(B0062) GST Inc: **$2,059**

HP ProCurve Switch 2312 & 2324

HOT NEW PRODUCT



Ideal for low-cost, unmanaged 10/100 connectivity • Lowest Price 10/100 Switch • Includes 2 Built-in Gigabit transceiver slots • Brings 10/100/1000 solutions to the market • Media-flexible ports for uplinks and server connections • HP quality, functionality and performance • Plug and play solution

2312 (12 port unmanaged switch)
(B0063) GST Inc: **$979**

2324 (24 port unmanaged switch)
(B0064) GST Inc: **$1,399**

HP ProCurve Switch Modules

HOT NEW PRODUCT

HP ProCurve Switch Gigabit Stacking Kit
(78306) GST INC: **$426**

HP ProCurve Gigabit-SX Transceiver
(82140) GST INC: **$1,289**

HP ProCurve Gigabit-LX Transceiver
(82141) GST INC: **$2,049**

HP ProCurve 100/1000-T Transceiver
(A9127) GST INC: **$896**

HP ProCurve 100-FX SC Transceiver
(A9128) GST INC: **$714**

HP ProCurve Switch 4108GL

HOT NEW PRODUCT

The hp procurve switch 4108GL bundle is a high performance, Layer 2 modular switch, for high port-density needs at the edge of the network. The chassis bundle provides 72 half/full duplex, 10/100 autosensing ports, with hp auto MDIX, transceiver module for uplinks and 4 free module slots. In addition, the switch offers built-in management (including SNMP and RMON) and fast path technology for wire-speed switching.



(C5871) GST INC: **$17,969**

HP NETSERVER E-200

The Server with the best price/performance value for small businesses.

Starts your small business off on the right Track. The HP NetServer E200 offers the best value-to-performance ratio of any major server supplier.

A desktop PC may do the job when you are starting out, but as your small business expands, it quickly out grows the ability to cut corners on something as fundamental as a server. And with the HP NetServer E200 HP leads the top tier server suppliers offering full server grade technology, functionality and performance for the price of a PC.

- Intel PIII 1GHz processor with 133MHz front side bus
- 128MB registered ECC RAM standard (expandable to 768)
- 9.1GB, 10,000RPM, 68-pin Ultra Wide SCSI HDD
- Four PCI, one ISA
- Integrated HP NetServer 10/100TX LAN adapter



(C5879) GST INC: **$3,068**

Rent 3 yrs - $30.08 per week* Call for long term *rental pricing

HP ProCurve Switch 408
Unmanaged 8 port 10/100 switch in a compact sized package. This switch offers half/full duplex, 10/100 autosensing on every port. Warranty: Lifetime, Exchange Next Day
(79125) GST INC: **$356**

Australian Government Endorsed Supplier Supporting Australian Business

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All systems include: 7 mass storage shelves (4 available after floppy, CD-ROM & 9GB disc), 5 expansion slots (4 PCI, 1 ISA combination), integrated 10/100 network interface, and easy set up CD.

SEP 10

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HP Notebooks

Best-value, all-in-one business notebook PC

Whether you run your own business or work for a large enterprise, you need a notebook PC that helps you stay on top of it all. That 's why HP created the Omnibook XE3 —a convenient,reliable notebook that comes with everything you need to do business and have a little fun, too.Top performance, Internet working,multimedia,and instant access to your favourite applications —they're all built right in. By the company that understands businesses —no matter what size —better than any other:HP. With its sleek industrial styling and features that make it even easier to use,the HP omnibook XE2 builds on the foundation that made its predecessor —the HP omnibook XE3 —one of our most successful notebook PCs ever. And,of course,this notebook PC delivers the unmatched performance, value, reliability and support that distinguish the entire HP Omnibook family.

Web Direct
See Web Direct Link (at top of page) for more products and latest info!

HP OmniBook XE3 PIII



HP OmniBook XE3 PIII/800 128MB / 10GB CDS Modem / LAN Notebook, Intel Mobile Pentium III 800MHz, 256K Cache,
- 128MB SDRAM
- 10GB HDD
- 24xCD-ROM, FDD,
- 13.3" XGA TFT display,
- S3 Savage/IX Graphics controller,
- 16-bit Sound Blaster Pro-compatible sound,
- 56Kbps modem,
- 10/100 LAN, 2 type II or 1 type III,
- **Win 2000**
- Warranty : 1 Year, Return to HP / Dealer

(C5668) GST INC
$4,314
*RENT: $40.31/wk

HP OmniBook XE3 PIII/800 128MB / 10GB CDS Modem / LAN Notebook, Intel Mobile Pentium III 800MHz, 256K Cache,
- 128MB SDRAM,
- 10GB HDD,
- 24x CD-ROM, FDD,
- 13.3" XGA TFT display,
- S3 Savage/IX Graphics controller,
- 16-bit Sound Blaster Pro-compatible sound,
- 56Kbps modem,
- 10/100 LAN, 2 type II or 1 type III,
- **Win98**
- Warranty : 1 Year, Return to HP / Dealer

(C3331) GST INC
$4,135
*RENT: $38.64/wk

HP OmniBook XE3L Celeron



HP OmniBook XE3 Celeron750 64MB / 10GB CDS Modem / LAN Notebook, Intel Mobile Celeron750 MHz, 128K Cache,
- 64MB SDRAM,
- 10GB HDD,
- 24xCD-ROM, FDD,
- 13.3" TFT display,
- S3 Savage/IX Graphics controller,
- 16-bit Sound Blaster Pro-compatible sound,
- 56Kbps modem,
- 10/100 LAN, 2 type II or 1 type III,
- **Win 2000**
- Warranty : 1 Year, Return to HP / Dealer

(C7853) GST INC
$4,249
*RENT: $39.71/wk

HP OmniBook XE3 Celeron750 64MB / 10GB CDS Modem / LAN Notebook, Intel Mobile Celeron750 MHz , 128K Cache,
- 64MB SDRAM,
- 10GB HDD,
- 24x CD-ROM, FDD,
- 13.3" TFT display,
- S3 Savage/IX Graphics controller,
- 16-bit Sound Blaster Pro-compatible sound,
- 56Kbps modem,
- 10/100 LAN, 2 type II or 1 type III,
- **Win98**
- Warranty : 1 Year, Return to HP / Dealer

(C7852) GST INC
$3,999
*RENT: $37.37/wk

Ask About...



- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

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The Award Winning Sony 17" FD Trinitron Display

"...THE BEST 17" DISPLAY MONEY CAN BUY"
PC PowerPlay Magazine, July 2001

- Flat Display Trinitron Monitor
- Super Fine Pitch 0.24-0.25mm Aperture Grille
- Digital Multiscan Technology supports up to 1600 x 1200 @ 60Hz
- 8 Preset Resolutions for PC and Macintosh
- EZ Digital Control for Complete On-screen Menus
- High Contrast Anti Reflective Screen Coating
- Sony 3-year Warranty



PC Magazine Australia
July 2001
PC PowerPlay Magzine

FD Trinitron (CPDE220) (B1831) GST INC **$639**

Memory Stick



Memory Stick is a versatile memory storage solution for recording and transferring digital data. Utilising solid-state data storage technology, Memory Stick is able to provide fast random access, as well as quick read/write speeds.

MSA8A (88647) GST INC: **$69**
MSA16A (86779) GST INC: **$94**
MSA32A (88654) GST INC: **$125**
MSA64A (88648) GST INC: **$205**
MSA128A (C5887) GST INC: **$375**

AIT DRIVE SDX400B



Internal 35-90GB AIT-1A Back-Up Kit. Kit includes internal AIT-1A Drive, SCSI Cable and Terminator, Mounting Screws, Media Tape, Installation Guide, Retrospect Back-Up Software for WIN 95/98/NT/2K/Me & Mac O/S. 3Year On-Site Exchange Warranty.

External Drive also available (C7478) GST INC **$3,883**

(C7480) GST INC **$3,467**

DDS DRIVE SDT11000B



Internal 20-40GB DDS-4 Back-Up Kit.
Kit includes internal DDS-4 Drive, SCSI Cable, Mounting Screws, Media Tape, Installation Guide, Retrospect Back-Up Software for WIN 95/98/NT/2K/Me & Mac O/S. 3Year On-Site Exchange Warranty.

External Drive also available (C6692) GST INC **$2,587**

(C6114) GST INC **$2,155**

CDR/RW KIT CRX161182U



Internal IDE CD-R/RW Kit, 16x Recorder, 10x ReWriter, 40x Playback.
- MAXIMUM Recording & Playback Performance. Features Burn Proof anti-buffer-under-run technology for reliable recording and supports accelerated audio extraction for fast disk duplication. Supports Disc At Once, Track At Once, Session At Once, Multi-Session & Packet Writing Recording Methods.
- Supplied with Software, 1 x CD-R & 1 x CD-RW disk, Cables, Media and Mounting Screws. Windows 95/98/NT/2000 & Me Compatible.

(C7494) GST INC **$389**

CDR/RW KIT CRX1600LEK



External i-LINK/FireWire/IEEE1394 CD-R/RW Kit, 12x Recorder, 8x ReWriter, 32x Playback.
- Precision Sony Optics, Fast 150ms File Access, Large 4MB Buffer, Accelerated 4x Audio Mode, 110/240V Compatible.
- Supplied with Adaptec Easy CD Creator, DirectCD & Toast Software, Cables and Media. Compatible with Windows 95/98/NT/2000 & Me and Macintosh O/S 8.6 or Higher. Requires (i-LINK/IEEE1394 or FireWire Compatible Interface.

(C4442) GST INC **$747**



HARRIS TECHNOLOGY
for all your computer needs!

Cyber-shot DSC-P30KIT

Memory Stick Digital Camera 1.3 Megapixel

3x Optical Zoom (6x Digital), Optical Veiwfinder, 1.5" LCD, MPEG Movie EX (w/o Audio), TIFF Mode, E-mail Mode, Clipmotion, AF Illuminator, Video Out, USB Terminal, Intelligent Flash with Red Eye Reduction. Supplied Accessories include 4MB Memory Stick, InfoLITHIUM STAMINA Battery, Power Supply, Carry Case, MGI Photosuite and VideoWave Software.



(C7577) GST INC **$969**

Cyber-shot DSC-P50KIT

Memory Stick Digital Camera 2.1 Megapixel

3x Optical Zoom (6x Digital), Optical Veiwfinder, 1.5" LCD, MPEG Movie EX (w/o Audio), TIFF Mode, E-mail Mode, Clipmotion, AF Illuminator, Video Out, USB Terminal, Intelligent Flash with Red Eye Reduction. Supplied Accessories include 4MB Memory Stick, InfoLITHIUM STAMINA Battery, Power Supply, Carry Case, MGI Photosuite and VideoWave Software.



(C7578) GST INC **$1,149**

Mavica MVCCD300

Mini CD-R/RW Mavica Digital Still Camera 3.3 Megapixel

3x Optical Zoom (6x Digital), Carl Zeiss Lens, MPEG Movie HQ, TIFF Mode, E-mail Mode, Clip Motion, AF Illuminator, VideoOut, USB Terminal, Intelligent Flash with Red Eye Reduction, Mini CD-R and CD-RW supplied



(C4276) GST INC **$2,289**

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SONY

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Introducing The Sony Spring Line Up



FX800

- PIII 800MHz
- 128MB RAM
- 20GB Hard Disk
- DVD ROM Drive
- Video Out
- Built-in modem & network connector
- 14.1" XGA (1024x768) Display
- Windows Me

(C6830) GST INC **$3,799**

FX880K

- PIII 850MHz
- 128MB RAM
- 20GB Hard Disk
- DVD ROM Drive
- Video Out
- Built-in modem & network connector
- 15" XGA (1024x768) Display
- Windows 2000

(C6835) GST INC **$4,699**

Sony VAIO R505 Series Notebook



- MagicGate Memory Stick Slot
- Built-in Modem & Network Connector
- 12.1" XGA (1024x768) Display
- 3 USB Ports & 2 i-LINK Ports
- Unique Jog Dial Control
- Docking Station Included
- Windows® Me

R505DT

- Pentium III 750 MHz
- 128MB RAM
- 15GB Hard Disk
- DVD ROM Drive

(C3537) GST INC **$5,199**

R505CT

- Pentium III 850 MHz
- 128MB RAM
- 20GB Hard Disk
- DVD/CDRW Drive

(C2156) GST INC **$5,899**



- Built-in Camera
- Unique Jog Dial Control
- 128MB RAM
- 15GB Hard Disk
- MagicGate Memory Stick Slot
- USB Port & i-LINK Interface
- Windows® Me

CIVG

(C5159) GST INC **$3,799**





MagicGate Memory Stick

Weighing a tiny 4 grams, the 32MB/64MB/128MB Magic Gate Memory Stick holds text, music, PC Data, mpeg movies and photos. Magic Gate Memory Stick can handle both copyright protected and non protected content.

MSG32A (C5925) GST INC **$159**

MSG64A (C5926) GST INC **$239**

MSG128A (C5927) GST INC **$399**

NO FURTHER DISCOUNTS AVAILABLE ON...

ALL SONY NOTEBOOKS AND ACCESSORIES SOLD FROM HARRIS TECHNOLOGY.

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Cost Effective PCs & Servers

Not all items are in stock at all stores but can be ordered!
HARRIS TECHNOLOGY

With more than 18 successful years in the IT industry, Ipex is ranked in the top 20 IT companies and top 5 Desktop/ Server manufacturers in Australia.

A leading manufacturer of desktop and server products, delivering systems to the Australian corporate and government sector, Ipex offer systems to best suite your computing needs at a cost effective price.

IPEX BUSINESS
A high performance, low profile, small form factor system designed to meet the needs of corporate users in the areas of expandability, value, security & ergonomics.

IPEX HOME
Ipex Multimedia Kit allows the inclusion of optional speakers, amplifier with front headphone and microphone connection and Front USB ports.

IPEX GRAPHICS
Provides 2x 5.25" and 2x 3.5" accessible plus 2x 3.5" hidden bays. Includes Ipex Multimedia kit. Expansion card clamps, cabling conduits and optional IR Receiver.

IPEX SERVER
The Ipex affordable small workgroup server. Based on an Ipex Discovery Motherboard, offering cost effective IDE storage, integrated into an Ipex Duality tower or desktop case. Integreated LAN, Dual Pentium III Processor capable with 4 memory slots to cater for future expansion. Configuration load tested to customer requirements during manufacture. Rackmount version also available. (Call for pricing).



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The figures quoted are based on a per week basis over 3 years. T.A.P, Terms & Conditions apply.

	BUSINESS	HOME	GRAPHICS	SERVER
PROCESSOR	Intel® Celeron™ Processor 800MHz	Intel® Pentium® III Processor 1GHz	Intel® Pentium® 4 Processor 1.5GHz	Intel® Pentium® III (Dual Capable) 1GHz
RAM	128MB SDRAM	128MB	128MB RDRAM	256MB/2GB Max
HDD	20GB	20GB	20GB	20GB IDE
CD-ROM	No	52x	No	Yes
DVD	No	No	Yes	No
MODEM	No	No	56K	No
LAN	Integrated NIC	10/100 NIC	10/100 NIC	10/100 NIC
OP SYSTEM	Windows® 2000	Windows® Me	Windows® Me	No
Rent*	$16.10	$20.59	$24.10	$24.00
GST INC	$1,469#	$1,879#	$2,199#	$2,190#
Part #	(C7784)	(C7788)	(C7793)	(C7864)
CRT MONITOR	15"	17"	19"	
Rent*	N/A	$6.02	$7.99	
GST INC	$399	$545	$729	
Part #	(C5931)	(C5932)	(C5950)	

Ask About...
- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

Ipex
INFORMATION TECHNOLOGY GROUP

#MONITORS NOT INCLUDED, ALL PICTURES FOR ILLUSTRATION PURPOSES ONLY

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APC®
AMERICAN POWER CONVERSION

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Power Back Up = Power Protection

APC Surge Arrest-PNote Pro®



Surge Arrest 5 Strip (A0098) GST INC **$54**

An APC SurgeArrest is your guarantee that your hardware and valuable electronics are protected regardless of lightning strikes and everyday unexpected power surges. SurgeArrest also offers the best protection from line noise which can cause glitches and errors in electronic operations and computer data.



PNote Pro (99592) GST INC **$46**

The SurgeArrest Notebook Pro Surge Protector provides the mobile notebook professional with advanced AC and telephone line protection. The unique, in-line design creates a compact, lightweight surge protector that is truly portable and appropriate for use in any country throughout the world. With built-in Excess Current Detection, the Notebook Pro warns you against potential modem damage. A Velcro mounting strap and 6 ft. telephone cord eliminate the need to carry any additional accessories.



Back-Ups for PC's!

350va (C5446) GST INC **$199**

500EI (C5878) GST INC **$Call**

650va (56231) GST INC **$259**

APC Back Ups Pro® for Workstations

Smart battery backup & high performance surge suppression for Windows 95 & NT PCs

• PowerChute® Plus software lets your UPS shut down your applications gracefully in the event of an extended power failure • Additional outlet for protection of printers • Audible alarms • Phone/ modem protection • User replaceable, hot swappable batteries



APC Back-UPS Pro **280si** (76636) GST INC **$252**

APC Back-UPS Pro **420si** (76637) GST INC **$339**

APC Back-UPS Pro **650si** (76638) GST INC **$459**



APC Symmetra Power Array 8kVA, exp. to 16kVA (71087) GST INC **$13,529**

So good we use it ourselves!

APC Smart-UPS Rack Mounts® for Servers

Smart-UPS 700, 1000, and 1400 2U Rack Mounts

Network power protection to increase availability of your system. APC Smart-UPS 2U Rackmount features include longer runtime to keep your system safe and a 2U design to save your valuable rack space by 30%. Hot swapping batteries is also now faster and easier with the replacement battery chassis tray.



APC Smart-UPS **2u700VA** (99595) GST INC **$695**

APC Smart-UPS **2u1000VA** (99596) GST INC **$1,012**

APC Smart-UPS **2u1400VA** (99597) GST INC **$1,425**



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All Your Portable Organisational Needs

handspring VISOR™ Expandability

Expand your possibilities with handspring

All handspring units have expansion slots. The expansion slot can transform the Visor into an MP3 player, a digital camera, scanner and more

VISOR™
- A great starter
- Based on the popular Palm OS
- AAA batteries for approximatly 2 months standard usage
- 2Mb RAM
- Infinitely expandable through the Springboard Expansion Slot

(C7718) GST Inc: **$345**





VISOR EDGE™
- Slim, sleek design
- Based on the popular Palm Operating System
- 8mb RAM
- Rechargeable battery
- Choose from:

Silver (C1937)
Metallic Red (C1943)
Metallic Blue (C1942)

GST Inc: **$949**



VISOR DELUXE
- Based on the popular Palm OS
- AAA batteries for approximatley two month's standard usage
- 8Mb RAM
- Available in:

Graphite (C1935)
or Blue (C1936)

GST Inc: **$529**



VISOR PRISM
- Over 65,000 colours displayed on a backlit LCD screen
- Lets you view picture-quality graphics like photos, videos, games and maps
- Rechargeable battery
- Based on the popular Palm OS
- 8Mb RAM (C1938)

GST Inc: **$979**



VISOR PLATINUM
- 50% faster than the Visor Deluxe
- Infinitely expandable through the Springboard Expansion Slot
- AAA batteries for approximately two month's standard usage
- Based on Palm OS
- 8Mb RAM (C1939)

GST Inc: **$599**

matrox

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Powerful 2D/3D Video Graphics Card

Matrox Millenium G550

The Matrox G550 graphics card series comes standard with 32 MB of Double Data Rate (DDR) memory, a 360 MHz primary RAMDAC, and a unique HeadCasting Engine accelerating 3D online communication.

The Millennium G550 is a titan among graphics cards with trendsetting appeal for the business and home entertainment markets. Comprising an extensive feature set including third-generation DualHead® display capabilities, outstanding 2D performance, and DVI - I support, the Millennium G550 delivers exceptional graphics performance and product stability and ignites a new trend in online communication.

KEY FEATURES:
- Matrox G550 chip
- 32 MB high-speed Double Data Rate (DDR) memory
- UltraSharp 360 MHz RAMDAC
- Explosive Windows desktop acceleration
- HeadCasting Engine for hardware-accelerated 3D facial animation
- Bundled HeadCasting software for 3D communication
- Third-generation DualHead® technology including eDualHead browser enhancements
- True multi-display support under the Microsoft® Windows® 2000 operating system



G55+MDHA32DB	Matrox G550 32Mb Single DVI output, Dual Head display	OEM	(C7873) GST INC.	**$300** RRP
G55+MADDA32DB	Matrox G550 32Mb Dual DVI output, Dual Head display	OEM	(C7874) GST INC.	**$336** RRP
G55+MDHA32DR	Matrox G550 32Mb Single DVI output, Dual Head display	RETAIL	(C7875) GST INC.	**$344** RRP
G45+MDHA16DB	Matrox G450 16Mb Dual Head display	OEM	(B3110) GST INC.	**$256**
G45+MVTA32DRi	Matrox G450 32Mb Dual Head display	RETAIL	(C0016)GST INC.	**$678**

Marvel G450e TV (PAL) 32Mb DDR inc Matrox PC-VCR and Matrox DVD Inc Ulead Videostudio 4.0 and Ulead Photo Explorer 6.0

HARRIS TECHNOLOGY @ Kmart
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Kmart Shoppers!

Not all products are in-store, but consulting & advice available on all items

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MAGELLAN™ GPS SYSTEMS

Prices are subject to change. Check here for latest prices & products!!

Web Direct www.ht.com.au/cat/magellan

Magellan GPS Systems



Magellan GPS 330

Boasting the most memory in its class, the Magellan MAP 330 is designed to meet the stringent navigation needs of the outdoor enthusiast and mobile progressional who demand superior reliability and functionality.The built in 8 Megabyte base map includes worldwide political boundaries and Australian cities, highways, major roads, waterways and more!

Features:

- Powerful 12 parallel channel receiver and super sensitive quadrifilar antenna for fast satellite signal locking and accurate tracking.
- Built in 8Mb map database displays major roads, highways, cities and other navigable details with advanced map database search.
- 8Mb of FLASH memory
- PC Upload/download capability for additional street detail via the optional MapSend Streets CDROM

(C5893) GST Inc:
$849



Magellan GPS 315

The GPS 315 is built to get you there and back, wherever you're going. Chart your bearing, heading, distance, speed and more with the help of nine easy-to-follow navigation screens. With the GPS 315, you can navigate to nearly 12,000 worldwide cities and record as many as 500 favorite locations for future return trips.

Features:

- Powerful 15 parallel-channel receiver
- Built in database of worldwide cities.
- 12hrs of continuous battery life on two AA alkaline batteries
- 1200 point SmartTrack records your path; BackTrack brings you home again.
- Store 500 waypoints.
- NMEA data output and DGPS ready.
- Weatherproof, compact and lightweight.

(B7506) GST Inc:
$499

Magellan GPS Map Companion



(*) refer to side bar for detail of GPS Map Companion clip Image

*Palm V series not included

(B7496) GST Inc:
$749

Turn your Palm V or Vx handheld into a powerful navigation tool that can pinpoint your location to within 10m on Australian street maps. Just clip the GPS Companion onto your Palm V series handheld and the receiver pinpoints your location.

Features:

- Powerful 12 parallel channel receiver with powerful tracking in most environments.
- Up to 10 hours on 2 AAA alkaline batteries.
- Compatible with most Palm software that access GPS
- Displays AMG/MGA position, Lat/Long, Elevation, Trip, Speed, Heading, Bearing, Odometer, Waypoints, Routes, GPS battery life and more!
- Weighs only 110gms.

Magellan GPS Map Companion

(*)



(B7496)



Magellan GPS 320

The GPS 320 personal navigator will take you where you want to go. Its built-in database puts more than 15,000 cities and nautical navigation aids in the palm of your hand.
Nine navigation screen's provide all the information you need on a high resolution, EL backlit display.

Features:

Specifications as per Magellan GPS 315, plus :

- Built in Database of world wide cities and navaids.
- Ships with PC/Power data cable.

(B7508) GST Inc:
$599

Collect 500 Bonus Fly Buys points when you purchase C5893, B7496, B7506 or B7508 between 20/08/01 - 30/09/01

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Optional Accessories for GPS 310,315 ,320 & 330



- Power data cable adaptor

(B7519) GST Inc: **$109**



- Power cable

(B7509) GST Inc: **$55**

- Vehicle Mounting Bracket (B7515) GST Inc: **$104**
- *Aquapac, clear plastic weatherproof case to hold both Palm with Companion Clip-On. *(Magellan GPS Map Companion ONLY) (C4290) GST Inc: From **$35**

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Sales: 1300 13 9999 **Web: www.ht.com.au**
Fax: 1300 13 6666 **Email: sales@ht.com.au**

Fly Buys. Would you like FlyBuys with that?

NETGEAR™

Prices are subject to change. Check here for latest prices & products!!

Web Direct www.ht.com.au/cat/netgear

Everybody's Connecting

Enquire for pricing on **Netgear 10 Mbps** hubs.



Wireless Connectivity

The NETGEAR 802.11b wireless family allows small businesses to benefit from the productivity gains of an "Always-on, Always-connected" mobile workforce. The products are based on industry- standard 802.11b, so the customer is ensured interoperability as well as security, with WEP encryption. And since it's NETGEAR the products are backed with a 5 year Limited Warrantly and Free 24x7 support.



ME102 Wireless Access Point (B9929) GST INC **$669**



MA401 PCMCIA Adapter (B9928) GST INC **$299**



MA301 PCI Adapter Cradle (B9927) GST INC **$99**



MA 101 Wireless USB Adapter (C7110) GST INC **$305**



MR 314 Wireless NAT Router (C5223) GST INC **$663**

FLY BUYS 500 BONUS POINTS

Collect 500 Bonus Fly Buys points when you purchase B9929, B9928, B9927, C7110 or C5223 between 20/08/01 - 30/09/01

Shared Internet Access

The NETGEAR routers offer the ability to connect to the internet easily using ISDN, analogue or Cable/DSL. All products support IP routing and offer NAT and DHCP for security and ease of set-up.

Enquire for pricing on Analogue and ISDN routers.



RT 314 4 Port 10/100 mbps switch with cable/DSL interface (A8862) GST INC **$385**

NEW

FV318 VPN and Firewall Route for Cable/DSL (C2298) GST INC **$802**



RO318 Cable/DSL Security router (C4896) GST INC **$499**

RP114 Web-safe Router (C5592) GST INC **$374**

RT 311 1 Port 10/100 mbps switch with cable/DSL interface (97719) GST INC **$298**

FR314 4 Port 10/100 mbps cable/DSL firewall router (B6554) GST INC **$635**

Web Direct

See Web Direct Link (at top of page) for more products and latest info!

Printer Servers

The NETGEAR print servers enable you to connect your printers to a network for sharing amongst multiple PC's.



PS 105 10 Mbps Print Server, (67225) GST INC **$223**

PS 110 10/100 Mbps Print Server, 2 parallel ports (67226) GST INC **$257**

PS 113 10/100 Mbps Print Server, 3 parallel ports (A3287) GST INC **$395**

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NETGEAR™

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Everybody's Connecting

Gigabit Solutions

These high performance Gigabit switches provides either fibre or copper backbone connectivity for power workgroups, data centres and server farms. No additional modules are required - each product is ready to install straight from the box.



GA 622T 32/64 bit PCI gigabit network card
(B9943) GST INC **$352**

FS 510T 2 port 100/1000 with 8 10/100 ports (copper)
(A1209) GST INC **$1,729**

GS 504T 4 port 100/1000 (Copper)
(A1375) GST INC **$2,249**

FS 518T 2 port 100/1000 with 16 ports 10/100
(A1374) GST INC **$2,195**

GS 508T 8 port 100/1000 gigabit switch
(B9916) GST INC **$2,709**

FS 517TS 16 port 10/100 stackable switch
(C2299) GST INC **$1,619**

10/100 Switching Solutions



FS 105 5 port 10/100 autosensing switch
(84722) GST INC **$149**

FS 516 16 port 10/100 auto-sensing and internal PSU/Vista
(60522) GST INC **$802**

FS 108 8 port 10/100 autosensing switch
(70905) GST INC **$263**

FS 524 24 port 10/100 switch
(77549) GST INC **$985**

FS 116 16 port 10/100 autosensing switch
(A5347) GST INC **$512**

FS 524S 24 port 10/100 switch - stackable
(B6540) GST INC **$1,528**

Dual Speed Hubs



DS104 4 port 10/100 hub
(70795) GST INC **$145**

DS116 - 16 port 10/100 hub
(81519) GST INC **$395**

DS106 - 6 port 10/100 hub
(84721) GST INC **$170**

DS108 - 8 port 10/100 hub
(18755) GST INC **$218**

DS516 - 16 port 10/100 hub, internal PSU, vista LED's
(18747) GST INC **$619**

DS524 - 24 port 10/100 hub, internal PSU, vista LED's
(69474) GST INC **$795**

The NETGEAR Starter Kits

Everything you need to start networking right away. Within a few minutes you will be able to share files and printer, exchange emails, play interactive games and share access to the internet.



SB 105 10Mb Hub 2x10/100, PCI, cables, internet sharing software
(A3293) GST INC **$129**

FB 105 10/100M Switch 2x10/100, PCI, cables, internet sharing software
(A3935) GST INC **$218**

Network Cards

FA 311 Ethernet adapter 10/100 PCI
(A1372) GST INC **$40**



FA 312 Ethernet Adapter
(A1373) GST INC **$48**

NEW

FA 411 10/100 Mbps PC Card (Without dongle)



(B9944) GST INC **$110**

FA 510 Network Card for Notebook PC
(81319) GST INC **$145**

Collect 500 Bonus Fly Buys points when you purchase 84722, 60522, 70905, 77549, A5347 or B6540 between 20/08/01 - 30/09/01

Call 1800 787 638 for 24 hour 7 days a week service support

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Small-Medium Business Networks

Web Direct
See Web Direct Link (at top of page) for more products and latest info!

DI-713P
D-Link Wireless IP Residential Gateway

D-Link 11Mbps Wireless IP Residential Gateway for xDSL and Cable modem with Switch and Print Server



- 11 Mbps Wireless Speed *802.11b Compliant Access Point *3 port 10/100 Mbps Ethernet Switch
- Hardware Firewall *Integrated Print Server
- Share Broadband Internet Access

NEW Wireless TECHNOLOGY

(C7596) GST Inc: **$798**

DSL-504
D-Link DSL-504 Remote Modem Router

With the D-Link ADSL Router with 4 port 10/100 Switch, speeding up your network has never been easier or more cost-effective. Offering multi-user connectivity many times faster than traditional modems plus incredible traffic management and security features that allow you to take control of your network, this router is designed to power the WAN link for your entire office.



NEW PRODUCT

(C7593) GST Inc: **$645**

DWL-1000AP
D-Link Wireless Access Point

Fast 11 meg Performance. Build The Size of Your Wireless Network, or Extend Your Existing Wired Network.



NEW Wireless TECHNOLOGY

(A9251) GST Inc: **$899**

DI-804
Cable/DSL Internet Gateway Firewall /Switch

- Intergrated firewall
- Configurable via Web Browser / Wizard
- 4 port 10/100 Mbps Ethernet Switch
- Broadband Cable or ADSL support
- Supports DHCP and NAT
- Supports automatic login to Bigpond Cables



(C2361) GST Inc: **$369**

For all your small to medium business and home network needs please call for more information and pricing. We have an extensive range of fantastic D-Link products on our database.

DGE-550T
Gigabit Ethernet Network Interface Card



The DGE-550T Gigabit PCI card for server connection. This card connects to the Cat. 5 twisted-pair cable, common at most network sites, to transfer data at a blazing 2000Mbps full duplex speed, eliminating all network bottlenecks.

NEW PRODUCT

(C7658) GST Inc: **$229**

DES-1218
Gigabit Ethernet Switch

OPTIONAL Giga Module

Unmanaged Smart Rackmount 16-port 10/100Mbps NWay Ethernet/Fast Ethernet Switch with 1 Empty Module Slot for 2 Port Gigabit Ethernet Module



(B7166) GST Inc: **$974**

Description	Part #	GST Inc
D-Link DWL-120 D-Link Air 11 Mbps Wireless LAN USB Adapter IEEE802.11b	(A8487)	$349
D-Link DWL-650 D-Link Air 11 Mbps Wireless PCMCIA Card IEEE802.11b	(A9247)	$299
D-Link DSL-300 Ethernet ADSL Modem	(B7198)	$425
D-Link DES-1226 Giga Ethernet Switch-Unmanaged-24-port 10/100Mbps	(B7168)	$1,294
D-Link DES-1008D 8-port 10/100Mbs Fast Ethernet Switch,. Plam Size	(98254)	$229
D-Link DES-1016R 16-port 10/100Mbs Fast Ethernet Unmanaged. Rackmountable	(98255)	$795
D-Link DP-313+ D-Link 11Mbps Wireless Print Server	(C7603)	$625
D-Link DKVM-4 D-link PRO-CONNECT 4-Port Keyboard-Video-Mouse Switch	(C7604)	$340
D-Link DFE-538TX PCI-bus 10/100M Fast Ethernet Network Interface Card	(C7605)	$35

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D-Link®

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Home Networking & Digital Camera

DFE-910
Performance Network Kit

Contains, 2 x10/100 Mb PCI Network Adapters, 1 x 5 port 10/100 Mb Switch, cables, internet sharing software and games.

(88060) GST Inc: **$273**





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DSC-350
Dual Mode Digital Still Camera

Multi-purpose 350k Digital Camera. Record up to 145 still images or 4.5 mintues of video. Max. resolution 1024 x 768. Up to 30 fps at 640 x 480 resolution in WebCam mode. 8Mb of flash memory. Bundled software and accessories.



(B3268) GST Inc: **$312**

DSB-C300
USB Digital Video Camera

This WebCam is a high resolution USB digital video camera. The DSB-C300 supports video with 64 million colours at 30 frames per second and 300k resolution using the high bandwidth of USB interface, and advanced light-sensing CMOS technology. As a fully contained unit, no video capture card or additional hardware is necessary.



(C2364) GST Inc: **$118**



Fast Delivery Australia-Wide

DKVM-2
Pro-connect 2-Port Keyboard-Video-Mouse Switch

NEW PRODUCT

The D-Link DKVM-2 is a 2 Port keyboard, Video, and Mouse switch. It enables a user to control 2 different PC's using one keyboard, monitor, and mouse. It provides many easy to use features. The DKVM-2 is targeted at home and small businesses.



(C7576) GST Inc: **$189**

DSB-H4
4-Port USB hub

NEW PRODUCT

The D-Link DSB-H4 is a 4-port Universal Serial Bus USB hub that allows a user to connect up to four USB peripherals or devices to their USBready PC or iMac. It provides an out of the box industry standard Bus. The DSB-H4 is targeted at PC and iMac users that are expanding the number of USB ports on their system.



(C7580) GST Inc: **$Call**

Not all items are in stock at all stores but can be ordered!
HARRIS TECHNOLOGY

DSS-5+
5-Port 10/100 Mps Dual SpeedSwitch

5 port 10/100 Mbps Dual Speed Switch with 5 x RJ-45 ports. Plug-and-Play installation, designed for Gaming, Multimedia and PerformanceUsers.



(89269) GST Inc: **$179**

DFW-500
3-Port Firewire Adapter

- IEEE1394 Compliant
- High Performance Serial PCI Bus Adapter Card.



(C7545) GST Inc: **$Call**

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DIGITAL TAPE SOLUTIONS

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Web Direct www.ht.com.au/cat/digital

Next Generation Backup Solutions

media

DLT Tape Media IIIXT 15/30GB Tape
(68362) GST INC **$80**

DLT Tape IV Media 20/80GB
(71231) GST INC **$155**

DLT Cleaning Tapes
(97851) GST INC **$93**

Super DLT Media 110/220 GB
(B9825) GST INC **$330**

Exatape 112 - 8mm
(C1976) GST INC **$12**

Exatape 160 - 8mm
(C1980) GST INC **$22**

Exatape AME - 125m
(C1986) GST INC **$105**

Exatape AME- 170m
(77600)GST INC **$170**

Exatape AME 2-150m
(C1989)GST INC **$180**

Exatape 8mm Cleaning Tape
(C1982) GST INC **$29**

Exatape AME 18c Cleaning Tape (C1983)
GST INC **$36**

Ecrix VXAI - M62 12/24 GB
(91103) GST INC **$89**

Ecrix VXAI - M107 20/40 GB
(C3945) GST INC **$129**

Ecrix VXAI - M170 33/66 GB
(91105) GST INC **$197**

Ecrix VXAI - 1m Cleaning Tape
(91104) GST INC **$102**

Collect 1000 Bonus **Fly Buys** points when you purchase B6511 or B6512 between 20/08/01 - 30/09/01

Quantum



QUANTUM DLT TAPE DRIVES

Quantum DLT8000/S internal 40/80 GB (82501) GST INC **$6,390**

Quantum DLT8000/ST external 40/80 GB (82502) GST INC **$7,240**

Quantum SDLT220/S internal 110/220 GB (B9821) GST INC **$11,570**

Quantum SDLT220/ST external 110/220 GB (B9823) GST INC **$11,950**

Quantum



QUANTUM DLT 1 ECONOMY TAPE DRIVES

40GB native, 80GB compressed
3-6MB sec sustained, that's 21.6GB/Hour
Ultra Wide SCSI LVD interface
Reads DLT4000 tapes (20/40GB Only)
LINUX Approved
Compatible with most common backup software
Standard DLT form factor

INTERNAL (88037) GST INC **$2,989**

EXTERNAL (88038) GST INC **$3,650**

Maxtor

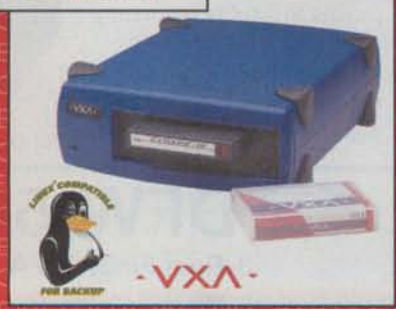


Max1394-40GB External Disk Drive
40 GB Raw Ultra ATA Disk, Firewire ready, or use PCI Card
(B6511) GST INC **$635**

Max1394-80GB External Disk Drive
80 GB Raw Ultra ATA Disk, Firewire ready, or use PCI Card
(B6512) GST INC **$895**

Max1394PCI Adapter Card for Windows 98/2000
Dual 400 MB/sec Firewire Interface, Mac and PC Compatible, Plug and Play
(B4383) GST INC **$110**

Ecrix



VXA 1 TAPE DRIVE

- 33 GB Native, 66GB compressed
- 3-6MB sec sustained, that's 21.6GB/Hr
- SCSI-2 and LVD models available in variety of case colours
- Variable speed operation matches data throughput to your computer
- LINUX and Apple Mac approved.
- Compatible with most backup software

INTERNAL (C1847) GST INC **$2,170**
EXTERNAL (C1915) GST INC **$2,615**

EXTERNAL BUNDLE PACK (B1856) GST INC **$2,495**

OVERLAND



DLT1 Autoloader

- 400 GB native, 800 GB compressed capacity
- DLT1 Single Tape Drive included
- 10 tape capacity
- Overland DLT reliability
- LVD 68 pin SCSI interface
- Includes 1 data tape and cable
- 20 GB/Hr throughput.
- Optional On-site warranty.

(A0476) GST INC **$9,800**

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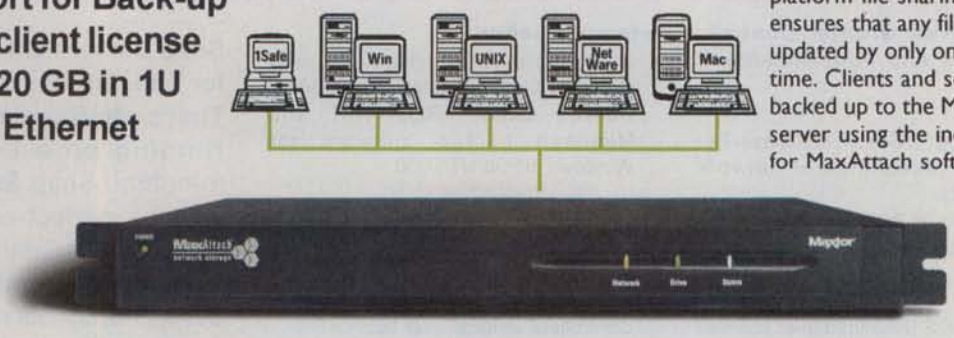
Network storage you can use

MaxAttach™ network storage

MaxAttach NAS 4100 File Server

- Windows, UNIX/Linux, NetWare and Macintosh file sharing
- NAS Powered by Windows operating system
- RAID Levels 0,1, and 5 data protection
- ADS/NDS/NIS Support
- SCSI port for Back-up
- No per-client license
- Up to 320 GB in 1U
- Gigabit Ethernet

FILE SHARING: MaxAttach NAS 4100 can be used for simultaneous multi-platform file sharing. File locking ensures that any file can be updated by only one client at a time. Clients and servers can be backed up to the MaxAttach file server using the included 1Safe for MaxAttach software.



The new MaxAttach NAS 4100 file server delivers seamless integration. With a Windows Powered operating system, the NAS 4100 is network storage that you can manage with the tools you have now. From backup support, to device management, to directory services, the NAS 4100 is the new network storage solution that you already know how to use.

NAS 4100 **160GB**

(B9954) GST INC **$6,950**

***RENT: $60.30 /wk**

NAS 4100 **320GB**

(B9955) GST INC **$9,995**

***RENT: $85.34 /wk**





DON'T FORGET your Fly Buys points!

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RENTSMART

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The figures quoted are based on a per week basis over 3 years. T.A.P, Terms & Conditions apply.

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Quantum

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If it's important to you, save it with us




1. Plug into AC power


2. Connect to Ethernet hub


3. Turn Snap Server on

INSTALL UP TO 900GB ON YOUR NETWORK IN MINUTES!!!

Australian Government Endorsed Supplier

LOCAL, STATE OR FEDERAL GOVERNMENT? CALL OUR GOVERNMENT HOTLINE FOR SPECIAL PRICING: (02) 8879 5086

Delivering Even Greater Control, Security and Functionality

Ease of Use
- Auto-sensing 10Base-T/100Base-TX
- Automatic recognition of network types/clients
- Supports DHCP, BOOTP and RARP
- Configuration via Web browser

Features
- Embedded OS (unlimited user license)
- Easily supports 100 or more clients
- Disk space quota set by administrator
- Full functioning FTP server
- SNMP support
- SMART predictive disk failure analysis

Compatibility
- Simultaneous support for Windows 2000, NT, NetWare, UNIX, Linux and Macintosh networks, and clients across TCP/IP, IPX, NetBEUI and AppleTalk networks
- Complete NFS 3.0 protocol support

Network Backup
- Compatible with Windows and Netware backup software, including Backup Exec, ARCserveIT and Microsoft backup software for Windows 95/98/NT/2000

Network Security
- Set access permissions at file and directory level
- Integrates with Microsoft Domain Controllers or local user list

Guarantee
- 3-year parts and labour

Price
- **20GB** (C0034) GST Inc. **$1,380**
- **40GB** (C0035) GST Inc. **$1,998**
- **80GB** (C0036) GST Inc. **$3,349**
- **160GB** (C0037) GST Inc. **$6,590**
- **300GB** (C0038) GST Inc. **$10,499**
- **960GB** (C0038) GST Inc. **$Call**

Snap Servers are engineered for one purpose: file sharing. That's why they can be up and running on a LAN in just minutes! Snap Servers offer you the perfect combination of quick and easy installation when compared to an NT server. Snap Servers are pre-configured to work in all major network environments, which means you just plug it in and turn it on, with no network downtime.



Snap! appliances



Ask About...

EXTENDED HARRIS TECHNOLOGY WARRANTY

- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

The New Snap Server 12000:

The Snap Server 12000 is designed to meet the capacity needs of larger workgroups and departmental customers and provides robust, high-availability features required for larger-capacity servers. The new Snap 12000 is easier to set-up and maintain than SCSI-attached RAID and provides a lower total cost of ownership than large NT or UNIX servers

Product Features:

- 3U (5.25") rack-mount form factor
- 12 hot-swap hard drives
- 960GB raw capacity (750GB in RAID 5) RAID 5, 1, 0
- Redundant, hot-swappable power supplies and fans
- 10/100/Gigabit Ethernet (auto-sensing)



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iomega

Harris Technology for all your computer needs!

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Web Direct www.ht.com.au/cat/iomega

Smart Storage Solutions

Network Attached Storage

NAS 160GB



Iomega serves up performance! Iomega® NAS 160GB servers, with Windows 2000 technology and multiple high-speed interfaces Ethernet and Ultra 160 SCSI. Includes free 20-seat license for QuikSync™ 3 automatic client backup software.

(C5567) GST Inc: **$8,798**



NAS 320GB

Iomega serves up performance! Iomega® NAS 320GB servers, with Windows® 2000 technology and multiple high-speed interfaces for 10/100 and Gigabit Ethernet and Ultra 160 SCSI. Includes free 50-seat license for QuikSync™ 3 automatic client backup software.

(C5568) GST Inc: **$12,579**

Peerless

The next generation in high-capacity removable storage. Iomega's Peerless(TM) drive system offers 10GB and 20GB disks, interchangeable interfaces, and 15MB/sec transfer rates for stunning performance. Firewire® and USB 1.1 interfaces available.



(C3525) GST Inc: **$798**

Zip 100MB disk: (23772) GST Inc: **$25**

10-pack: (21889) GST Inc: **$205**

Zip drive carry case (31823) GST Inc: **$49**

Zip parallel cable (46305) GST Inc: **$39**

Zip SCSI cable (46304) GST Inc: **$35**

Zip disk labels 20-pack (48059) GST Inc: **$5**

Jaz 2GB External Drive (78941) GST Inc: **$749**

Jaz 2GB disk (61652) GST Inc: **$209**

Jaz 2GB 3-pack (57271) GST Inc: **$595**

Jaz 1GB disk (24218) GST Inc: **$199**

Jaz 1GB 3-pack (32844) GST Inc: **$589**

Predator

Iomega Predator CD-RW drive



Iomega® Predator(TM) Firewire (8x4x32) drive
Announcing the latest addition to the hottest looking external CDRW in the Iomega range - the new Predator with Firewire connection. PC and Mac compatible, the new Predator Firewire allows true drive speed of 8x4x32, and provides versatility with interchangeable USB & PCMCIA adapters.

Predator™ USB Iomega CD-RW External
(B4416) GST Inc: **$549**

Iomega CD-RW™ USB External 4x4x6
(92623) GST Inc: **$459**

Predator™ Firewire 8x4x32
(C2413) GST Inc: **$742**

Iomega CD-RW

Internal Drive



Iomega ZipCDRW Internal drive is the ideal way to store, share and archive information in a common 650MB format. Compatible with Windows 2000. Also ships with Adaptec Easy CD Creator v4.02c and Direct CD 3.01.

16x10x40
(C2414) GST Inc: **$549**

12x10x32
(B0882) GST Inc: **$448**

Host Powered 250 USB



NEW – Host-powered Zip® 250MB USB drive Now it's even easier to take your information with you. The Zip® 250 USB drive is now available with a USB cable that provides both data and power, so you don't need any external power source. Its easy to connect (just plug it in) and easy to launch (no rebooting)! This new drive is compatible with most major operating systems and all Zip 100MB and 250MB Zip disks.

Host powered 250 USB Ext
(B6404) GST Inc: **$375**

Not all items are in stock at all stores but can be ordered!

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See Page 2 for Locations

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CD-R/W, Camera's & Caching Towers

PlexWriter 24/10/40A-IDE

Now you can collect Fly Buys points when you purchase from HARRIS TECHNOLOGY.

The PlexWriter 24/10/40A E-IDE (ATAPI) drive, with built-in BURN-Proof technology, delivers exceptionally fast performance in a professional 3-in-1 CD solution, while upholding the legendary Plextor reliability. PoweRec II, an exclusive Plextor technology, guarantees the highest quality write across a broad base of media.

The PlexWriter 24/10/40A's name means that it records CD-R discs at 24X speed, rewrites CD-RWs at 10X, and reads back all CDs at 40 speed. Top-notch manuals and software make installation easy. The drive's accuracy is perfect - no misses or skips. Plextor are the leaders in CDRW. BURN Proof (Buffer Under RuN - Proof) enables you to stop writing before buffer under run errors occur and then to continue writing by tying last point of recording and the next start point ... no more drink coasters.

Our customers are telling us that these drives are the best of the best and they are coming back for more. Comes with software, cables, manuals, ready for installation.



PLEXTOR®

(C7688) GST INC **$679**

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AXIS Network Cameras



In-built web & ftp server NO PC needed!

'Plug & Watch' remote monitoring

Axis cameras plug directly into an Ethernet hub or network outlet. Each camera has its own IP address allowing images to be viewed over the Internet or your LAN using a standard web browser (I.E., Netscape etc.). Remotely monitor your office, home, factory, car park or anywhere you choose. One Axis network camera replaces a web cam, a PC, network interface card & software! It's all built into the camera including an embedded LINUX OS! As used on beaches & ski fields around Australia & the world.



Actual image of thief caught with an Axis Camera!

AXIS 2100 FOR INDOOR USE: (97648) GST inc. **$1,239**

AXIS 2120 FOR OUTDOORS (A3916) GST inc. **$2,750**

(includes auto-iris lens & motion detection)

AXIS COMMUNICATIONS

Fast Delivery Australia-Wide



How to put up to 254 CD's into 1 convenient central 5 bay CD tower

The market leading CD tower offers fast and simple sharing of CD (and DVDs) on your network. New caching technology enables you to quickly store 100's of CD's onto a built-in fast hard disk within the tower. With the new optional CD-R/RW feature, the CD tower can also feature 'writing to CD' across the network.

- Axis technology at the heart of the CD Tower
- NEW optional CD-R/RW function enables you to burn to CD across the network
- True plug n play NAS device - The Optistor CD tower can be plugged in anywhere
- In built web server for easy web browser management

Advanced CD caching technology!

(B6595) GST INC **FROM $2,599**

OPTISTOR®

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Get Connected With NetComm!

USB LAN Key

Plug into any Ethernet Network Instantly!



(C7651) GST INC:
$88

Logging on to a Local Area Network (LAN) has never been quicker or easier with this Plug & Play USB LAN Key from NetComm. Now there are no cases to open, dongles to break, PC Cards to swap or NIC cards to insert. And you don't even have to reboot, operating system dependant.

Best of all, laptop users can keep both PC Card slots free and log on to any Ethernet 10Base-T or 100Base-TX network via their USB port. Your USB LAN Key 10/100 FastEthernet Adaptor removes the need to take up a PCI or ISA bus slot to add a LAN connection to a Desktop PC. With the USB LAN Key there are no messy and heavy external power supplies, saving energy and reducing the weight mobile users need to carry.

- Plug into any Ethernet network – Instantly, Hot or Cold
- FastEthernet 10 Base-T & 100Base-TX auto sensing Lan connection
- Frees up Desktop PCI Bus and Notebook PCMCIA slots
- Designed for USB-enabled PC's and Notebooks
- No external power supply required
- Supports Windows 95, 98, ME, 2000, NT4.0



HARRIS TECHNOLOGY
for all your computer needs!

PCI 10/100 Fast Ethernet Adapter

High performance – Auto sensing!



(C7657) GST INC:
$36

NetComm's PCI-LAN (NP-1100) is a high-performance auto-sensing 32-bit 10/100Mbps Fast Ethernet LAN adapter for desktop PC's.

This card features N-Way auto-negotiation, for automatic selection of the network speed and full/half duplex mode with the partner. In the fast full-duplex mode, the adapter's embedded flow control provides a means to protect users against possible data loss during transmission on the network.

- 10/100Mbps auto-sensing with single shielded RJ-45 connector
- Full/Half duplex for 10Base-T & 100Base-TX
- IEEE 802.3x flow control for connection to LAN switch
- 16 On-Board counters for static report (DMI driver provided)
- 32-bit PCI Bus Master operation
- Wake-On-LAN (WOL) function & cable
- Low network command processing overhead
- Supports Windows 95, 98, ME, 2000, NT4.0 + more

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CompactFlash Modem

56K FaxModem for PDA's and Notebooks With PCMCIA adapter



(C5469) GST INC:
$249

Now you can stay in touch wherever you are – with the CompactFlash 56K FaxModem for your Handheld PC, palm-size PC or PDA. All you need is a CompactFlash slot, telephone line and be running Windows CE 2.0 or 3.0 and you're away.

- Supports CompactFlash I/O type (CF+) and PCMCIA interface
- Controller-based (Hardware) modem: ITU V.90 56kbps
- Fax: EIA-578 Class I and II function, data rate up to 14,400bps
- Supports Windows 95, 98, ME, 2000, NT4.0, CE 2.0, 3.0
- Supports Video conference: ITU V.80
- Error correction: ITU-T V.42, MNP 2-4
- Data compression: ITU-T V.42bis & MNP5

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Power-UP to Intra

High performance Simultaneous, Multi-Line modem communication for Fax, E-Mail, Remote Access and the Internet.

NetComm's Intra Multi-Modem family of PCI cards ensures your business can meet the challenges of the Communications age – as and when you need it.

NetComm's INTRA 2, 4 and 8 port PCI card modems allow you to perform multi-line communications simultaneously. Now you can send and receive Fax's, download E-Mails, Remote Access your warehouse and Interstate office while also being connected to the Web. Intra will revolutionise your communications, all this and only using 1 IRQ address in your server.

- 2, 4 and 8 Port PCI Data/Fax/Voice Multi-Modem cards
- Hardware Acceleration
- 14.4Kbps Group 3 Class 1&2 Fax
- Support for Windows 95, 98, ME, NT 4.0, 2000 and Linux
- 56K V90 Modem
- Error correction: V42 LAPM, MNP2-4
- Data compression: V42 Bis and MNP5



(A8858) GST INC
$419
NETCOMM INTRA 2



(65782) GST INC
$989
NETCOMM INTRA 4



(90426) GST INC
$1,568
NETCOMM INTRA 8

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New this month

USB 2.0 PCI Card

F5U220 NEW



Belkin's USB 2.0 card is here bringing with it astounding 480Mbps speed to USB connectivity. With a bandwidth 40 times greater than 1.1 it is the ideal interface for transferring extremely large amounts of data from USB 2.0 compliant products such as real time video cameras, scanners, portable drives and others.

(C7546) GST Inc: **$215**

6-Port Firewire

F5U526 NEW



The Belkin 6-Port FireWire Hub connects multiple FireWire peripherals through a single port. Perfect for state-of-the-art computers like the new Power Macintosh G4 Cube and PC enthusiasts wanting to add more FireWire capabilities to their computer, the new 6-portFireWire hub from Belkin is available now

(C4593) GST Inc: **$279**

Belkin Surge Protection is here..

Surge control is important because even small surges or spikes can eventually destroy or affect the performance of expensive electronic equipment such as a computer, phone, fax, TV, VCR, stereo or microwave. Damage can occur either instantaneously or over time as smaller surges cause the gradual deterioration of internal circuitry, to voltage fluctuations.

No Hassle Warranties Belkin offer the best Connected Equipment warranties in the business. Full warranty protection means your equipment is insured against damage due to power disturbances of all kinds - surges, spikes, even lightning strikes.

Home Office Range

Connected Equipment Warranties up to $25,000.

F5C205z4



Belkin's SurgeMaster line has been designed to protect entry-level computers, dot matrix printers, personal copiers and all other sensitive electronics in the home or office. Telephone/fax/modem protection

27,000 Amps of AC protection

(C4603) GST Inc: **$50**

Superior Grade

Connected Equipment Warranty up to $50,000 .

F5C206z2



Pentium III computers, audio/video equipment and office equipment need extra protection.

- 6-way Superior Grade range

AC Line protection

(C4604) GST Inc: **$73**

Maximum Grade

Connected Equipment Warranties up to $80,000.

F5C208z2



Maximum Grade series ideal for protecting commercial business computers, ADSL and cable modems, high-end printers and copiers, and sensitive audio/video equipment such as satellite receivers and home cinema

39,000 Amps of AC protection

(C4607) GST Inc: **$92**

Belkin Has All Of Your Mobility Solutions!

PDA ACCESSORIES

F8E391 Universal PDA Case Finegrain Leather-

Black (B6767) GST Inc: **$35**

Tan (C4690) GST Inc: **$35**

F5U109 USB PDA Adapter (B6768) GST Inc: **$52**

F3X1051-03 Hot Sync Cable for Palm III/VII (C4685) GST Inc: **$35**

USB pocket Hub

F5U007-UNV-AUS



The Belkin Pocket Hub allows yout to instantly connect USB devices such as printers, scanners, external mice and keyboards, joysticks, digital cameras, or other USB hubs without having to restart your computer.

(C4577) GST Inc: **$65**

Optical MiniScroller™

F8E882 NEW



Smaller than the standard mouse, the Optical MiniScroller™ is perfect for travelers. No bulky mouse taking up prime space in your notebook bag. USB or PS/2 compatible, it features 8-directional scrolling and one-touch zoom control. It works with Windows™ 95, 98, Windows NT and W2000.

(C4699) GST Inc: **$38**

Stone St Laptop Bag

F8E157



The Stone Street has a fully padded computer section that measures 39 x 28 x 10, for the most popular notebook style computers, and a fully equipped external pocket which measures 36 x 25 x 7.

(B6769) GST Inc: **$50**

Don't Forget...

USB Cable

F3U133



A Belkin Gold Series USB device cable will keep those dream machines error free. Features high performance 20-gauge power wires & Gold Plated connectors which allow you to maximize the full potential of USB.

USB Device Cables

A-B, 1.8m - (96893) GST Inc: **$12**
A-B, Gold 1.8m - (96875) GST Inc: **$17**
A-B,3m - (96876) GST Inc: **$24**
A-B, Gold 3m - (A7753) GST Inc: **$29**

*Also available in colours: tangerine, blue, grape, lime, & strawberry

USB Extension Cables

Male-Female, 1.8m - (96895) GST Inc: **$14**
Male-Female, Gold 1.8m - (96878) GST Inc: **$18**
Male-Female,3m - (96879) GST Inc: **$22**

Printer Cable

F2A046



This Gold Series Parallel Printer Cable links your IEEE 1284 printer with a Centronics 36-port to your PC with a DB25 port. Featuring Gold plated connectors for maximum conductivity and corrosion protection.

IEEE 1284 Parallel Printer Cables

A-B, 3m - (96929) GST Inc: **$35**
A-B, Gold 3m - (96930) GST Inc: **$39**
A-B, 1.8m - (96927) GST Inc: **$22**
A-B, Gold 1.8m - (96928) GST Inc: **$29**
A-B, 6m - (96932) GST Inc: **$56**
A-B, Gold 7.5m - (96934) GST Inc: **$59**

Firewire Cable

F3N400



A high-speed serial bus that bridges the world of consumer electronics and computers. The IEEE 1394 FireWire® Compatible Cable attaches your PC or A/V device to your computer.

FireWire Compatible Cables 1.8m

6-Pin to 6-Pin Cable - (A7782) GST Inc: **$35**
6-Pin to 4-Pin Cable - (A7802) GST Inc: **$39**
4-Pin to 4-Pin Cable - (A7783) GST Inc: **$45**

FireWire Compatible Cables 4.2m

6-pin to 6-Pin Cable - (A7813) GST Inc: **$69**
6-pin to 4-Pin Cable - (A7812) GST Inc: **$45**
4-pin to 4-Pin Cable - (B2308) GST Inc: **$45**

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Belkin - KVM Switches allow one keyboard, video monitor and mouse to control multiple computers - from 2 to 256.

Omniview KVM Products

F1D102-AUS
F1D104-AUS



*D.C.= Daisy Chainable

F1D102-AUS- 2 Port KVM Switch, *D.C. (B6748) GST Inc: **$289**

F1D104-AUS- 4 Port KVM Switch, *D.C. (96915) GST Inc: **$389**

F1D104-USB-AUS- 4 Port USB KVM Switch (C4661) GST Inc: **$489**

F1D201-AUS- 2 Port Reverse KVM Switch (C4662) GST Inc: **$319**

Omniview Pro KVM Products

F1D104-OSD-AUS
F1D108-OSD-AUS



F1D104-OSD-AUS- 4 Port KVM Switch (A7797) GST Inc: **$789**

F1D108-OSD-AUS- 8 Port with On-screen display (A7798) GST Inc: **$885**

F1D116-OSD-AUS- 16 Port with On-screen display PS/2 only (C4663) GST Inc: **$1,849**

F1D208-OSD-AUS- Matrix 2X8 with On-screen display (C4664) GST Inc: **$1,949**



Fast Delivery Australia-Wide

Omniview KVM Adaptors

Convert standard PS/2 Keyboard,mouse and video signals.Allow Sun users to use the Belkin Omniview™, Omniview™ PRO, Omniview™ SE, or OmniCube™ KVM switches.



F1D082
PS/2 Sun Adapter (96911) GST Inc: **$344**

Omniview KVM Accessories

F1D103- Rackmount Kit (C4666) GST Inc: **$95**

F1D084- CAT5 KVM extender up to 150m (C4667) GST Inc: **$779**

F1D087- Keyboard/Mouse extender (C4668) GST Inc: **$124**

F1D088- Monitor extender (C4669) GST Inc: **$124**

F1D089- Keyboard splitter (C4670) GST Inc: **$124**

F1D090- Mouse splitter (C4671) GST Inc: **$124**

Omniview PS/2 KVM Cables



The easiest & neatest way to connect all your computers and servers to your PS/2 & USB KVM switches, providing image clarity for high-resolution applications.

F3X1835-06-GLD

All-in-one PS/2 Gold Series Kit, 1.8m (C4674) GST Inc: **$59**

F3X1835-10-GLD- All-in-one PS/2 Gold Series Kit, 3m (C4089) GST Inc: **$94**

F3X1835b15-GLD- All-in-one PS/2 Gold Series Kit, 4.5m- bag pack only (C4676) GST Inc: **$94**

F3X1835b25-GLD- All-in-one PS/2 Gold Series Kit, 7.5m- bag pack only (C4677) GST Inc: **$107**

Omniview USB KVM Cables

F3X1962-06- All-in-one USB Pro Series Plus Kit, 1.8m (C4680) GST Inc: **$37**

F3X1962-10- All-in-one USB Pro Series Plus Kit, 3m (C4681) GST Inc: **$64**

F3X1895-06-GLD- All-in-one USB Gold Series Kit, 1.8m (C4682) GST Inc: **$67**

F3X1895-10-GLD- All-in-one USB Gold Series Kit, 3m (C4683) GST Inc: **$74**

Desktop and Mobile Network solutions

Belkin NIC Cards are the best solution for connecting your desktop PC or notebook to a cable or DSL Internet modem or building a 10/100 Base-T Ethernet network.

F5D5000
10/100Mbps PCI NIC



(C5581) GST Inc: **$32**

F5D5020
10/100Mbps PCMCIA NIC - 16 Bit



(C5583) GST Inc: **$134**

F5D5010
10/100Mbps CardBus NIC - 32 Bit



(C5582) GST Inc: **$149**

Network Hubs and Switches

F5D384



F5D386



F5D384- 10BT 5-Port HUB (C5584) GST Inc: **$66**

F5D386- 10/100BT 5-Port Switch (C5585) GST Inc: **$194**

F5D387- 10/100BT 8-Port Switch (C5586) GST Inc: **$294**

Network Starter Kits

F5D380



F5D381



F5D380- Home starter kit (C5587) GST Inc: **$69**

F5D381- Pro Network kit (C5588) GST Inc: **$164**

F5D382- Mobile Network kit (C5589) GST Inc: **$134**

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Intelligent KVM Switches

ServerLink to computer cable
Each end of the cable fans out into three connectors.
2m cable for **PS/2** mouse, keyboard and monitor (63972) GST INC **$27**

5m cable (63976) GST INC **$59**

2m cable for **AT/Serial** mouse, keyboard and monitor (63974) GST INC **$26**

5m cable (63977) GST INC **$59**



Control multiple PCs or network servers with a single monitor, keyboard & mouse



3 YEAR WARRANTY

ServerLink Infinity Range

What is a ServerLink KVM Switch?

The ServerLink range of Auto KVM switches allow you to take full control of multiple PCs or network servers with just one monitor, keyboard and mouse. There is no software to load – just plug in your computers, plug in your monitor, keyboard & mouse and you are ready to go. All ServerLink KVM switches are hardware only solutions, totally independent of software and network operating systems. This ensures hassle free installation and error free switching & booting.



On Screen Display

- Select computers via On-Screen-Display or front panel
- Name computers for simple selection
- Mouse & keyboard emulation for flawless booting
- Scan Mode for periodic computer monitoring
- Standard cables used throughout
- Cascadable to control up to 256 computers
- 8 & 16 port models 19 inch rack mounted design
- Australian designed and manufactured



SERVERLINK INFINITY
PS/2 Computers Only

2 Port Model Now Available
FROM **$270**


SL-221

SL-221	2 Port ServerLink Infinity KVM Switch for PS/2 only	(B3047) GST INC **$270**
SL-221-P	2 Port ServerLink Infinity KVM inc. 2 x 2m PS/2 cables	(B3048) GST INC **$310**
SL-421	4 Port ServerLink Infinity KVM Switch for PS/2 only	(A9890) GST INC **$330**
SL-421-P	4 Port ServerLink Infinity KVM inc. 4 x 2m PS/2 cables	(B2759) GST INC **$425**
SL-821	8 Port ServerLink Infinity KVM Switch for PS/2 only	(97888) GST INC **$984**
SL-821-P	8 Port ServerLink Infinity KVM inc. 8 x 2m PS/2 cables	(97889) GST INC **$1,159**
SL-1621	16 Port ServerLink Infinity KVM Switch for PS/2 only	(97890) GST INC **$1,672**
SL-1621-P	16 Port ServerLink Infinity KVM inc. 16 x 2m PS/2 cables	(97891) GST INC **$2,019**

PS/2 & AT/Serial Computers

SL-401	4 Port ServerLink KVM Switch for PS/2 & AT/Serial	(63724) GST INC **$737**
SL-801	8 Port ServerLink KVM Switch for PS/2 & AT/Serial	(63777) GST INC **$1,230**
SL-1601	16 Port ServerLink KVM Switch for PS/2 & AT/Serial	(63778) GST INC **$2,069**

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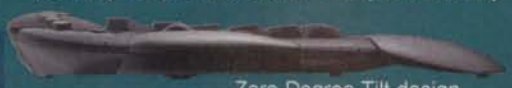
Cordless Freedom™ Optical





The ultimate cordless keyboard and optical mouse. This striking combination is cordless for less clutter, more style and more freedom. Seamlessly access and navigate the Internet at the touch of a button or the scroll of the iNav wheel. Intuitive multimedia controls are at your fingertips and allow you to control MP3s, DVDs and CDs from your keyboard. Every keystroke is made easy with Zero Degree Tilt, offering one of the slimmest keyframes available. Logitech's patented digital cordless radio technology is encrypted to secure your privacy. The included Cordless MouseMan® Optical will perform perfectly for years to come. Five-year warranty.

Collect 1000 Bonus Fly Buys points when you purchase C6106 between 20/08/01 - 30/09/01



Zero Degree Tilt design.

(C6106) GST Inc: **$245**

QuickCam® Pro 3000



With its CCD sensor, QuickCam Pro 3000 takes pictures and videos with true 640x480 resolution. Use its built-in microphone to make live video calls over the Internet and send pictures and videos with your emails. QuickCam software lets you easily setup a digital surveillance camera and broadcast live video and audio over the web. Add professional titles, fades and wipes to your videos with the included MGI software. Connection via USB.

(B0805) GST Inc: **$219**

QuickCam® Web



Logitech QuickCam Web has everything you need to capture video, send video e-mail, make live video calls, post web albums, broadcast over the Internet and more. With its integrated microphone and excellent assortment of easy-to-use software, QuickCam Web is the perfect Internet video camera for everyone. Connection via USB.

(A2833) GST Inc: **$169**

Collect 500 Bonus Fly Buys points when you purchase B0805 or A2833 between 20/08/01 - 30/09/01

SoundMan® S-20



Delivers high-definition sound, solid bass for your favourite CD/MP3 songs. Compact, attractive styling. Remote control with headphone jack. Includes digital music CD. 2-year warranty

(A5011) GST Inc: **$89**

Cordless MouseMan® Optical



This comfortable mouse for either hand combines advanced cordless and optical technologies. Digital Radio technology works in a two metre range without being pointed at the computer. Digital Security IDs lock out interference and make the receiver only listen to one mouse. Logitech's smart power management allows the mouse to work for months on the included AA batteries. The low battery indicator gives plenty of warning before needing to change batteries . PC/Mac. 5-year warranty.

(C1186) GST Inc: **$139**

Marble Mouse (B7946) GST Inc: **$69**



Cordless Mouse (C2310) GST Inc: **$89**



TrackMan Live! (77753) GST Inc: **$299**



Cordless TrackMan Wheel (A2157) GST Inc: **$119**



Cordless TrackMan FX (B0831) GST Inc: **$156**



Deluxe Access 104 (B0819) GST Inc: **$38**



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Backup and Portable Storage

Verbatim

Slim-line PC Card CD-ROM Drive

"Add a CD-ROM to your Laptop!"



This 24x CD-ROM drive will connect to any PC Card enabled PC or Notebook and is ideal for mobile computing.

(97766) GST Inc **$328**

DVD8X
- PC Card Portable 8x DVD-ROM drive

(B2931) GST Inc **$690**

CDRW4X
- PC Card Portable 4x4x20 CD-RW drive

(C7205) GST Inc **$533**

PCI Cards

Add super fast serial and parallel port interfaces to any PCI equipped PC.

(90688)
Priced from GST Inc **$77**



ACARD TECHNOLOGY MirrorSmart RAID System



- Protect against drive failure
- Uses IDE drives
- Connects to any UltraWide SCSI Card
- Automatic rebuild

***RENT: $12.04/WK** (B2913) GST Inc **$825**

Digital Memory & Readers

PRETEC CompactFlash



With CompactFlash Digital Film you can increase the storage capacity of any compatible digital camera or PDA.

16MB CompactFlash	(B2920)	GST Inc **$79**
32MB CompactFlash	(B2921)	GST Inc **$119**
64MB CompactFlash	(B2922)	GST Inc **$205**
128MB CompactFlash	(B2923)	GST Inc **$409**

PRETEC SmartMedia

SmartMedia cards expand the storage capacity of any compatible digital camera. Suitable for digital cameras from Olympus, Fuji and others.



8MB SmartMedia	(B2914)	GST Inc **$38**
16MB SmartMedia	(B2915)	GST Inc **$59**
32MB SmartMedia	(B2916)	GST Inc **$109**
64MB SmartMedia	(B2917)	GST Inc **$219**
128MB SmartMedia	(C3680)	GST Inc **$503**
SmartMedia Card Adapter	(B2918)	GST Inc **$109**

PRETEC Flash ATA



These credit-card sized cards use a metal case for maximum ruggedness. Solid state construction offers shock resistance.

8MB Flash ATA	(B9860)	GST Inc **$85**
16MB Flash ATA	(B9861)	GST Inc **$129**
32MB Flash ATA	(B9862)	GST Inc **$149**
64MB Flash ATA	(B9863)	GST Inc **$249**
160MB Flash ATA	(B9865)	GST Inc **$513**
256MB Flash ATA	(B9866)	GST Inc **$825**

* Higher Capacities available

PRETEC MultiMediaCard



MultiMediaCard is the world's smallest removable flash storage card! Suitable for MP3 players, Mobile phones and Digital Video Cameras.

16MB MultiMediaCard	(B9871)	GST Inc **$77**
32MB MultiMediaCard	(B9873)	GST Inc **$139**
64MB MultiMediaCard	(B9878)	GST Inc **$295**

SMARTDISK FlashPath Floppy Adapters



Read your memory cards in your PC's floppy drive. Simply place the card into FlashPath and download your photos.

FlashPath SmartMedia Reader	(B2924)	GST Inc **$175**
FlashPath MultiMediaCard Reader	(B2925)	GST Inc **$175**

USB Digital Memory Readers

Exchange data between your PC, laptop, MP3 player or Digital Camera.



SmartMedia and CompactFlash Card Drive	(B2926)	GST Inc **$95**
ATA Card Drive	(96056)	GST Inc **$99**
SmartMedia, Memory Stick and CompactFlash Card Drive	(B9882)	GST Inc **$163**
SmartMedia, Secure Digital/MMC and CompactFlash Card Drive	(B9884)	GST Inc **$163**

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Copying and Connectivity

Verbatim

CopySmart CD Copier



Copy discs with a single button press.
Standalone - no PC required.

50 FREE* DISCS
8x4x32 (B2904) GST Inc **$990**
*RENT: $10.85/WK

100 FREE* DISCS
16x10x40 (B9843) GST Inc **$1,489**
*RENT: $16.32/WK

*On Redemption: form avaliable in box for parts: (B2904) & (B9843) Bonus CD's sent after registration of goods. Offer expires 30th September 2001. Only available while stocks last.

KOUWELL PCI Firewire Cards

Connect your digital video camera to your PC. Download and edit your own movies.



PCI Firewire Card – 4 ports	(90689)	GST Inc **$109**
PCI Firewire Card – 6 ports	(A5161)	GST Inc **$223**
PCI Firewire Repeater Card – 5 port	(A5162)	GST Inc **$145**
PCI Firewire Repeater – 6 port	(A5163)	GST Inc **$154**
PCI Firewire Repeater – 10 port	(A5164)	GST Inc **$205**
6 pin to 6 pin Firewire cable	(B2905)	GST Inc **$22**

KOUWELL USB Hubs & Cards



USB Hub – 6 ports	(79702)	GST Inc **$89**
PCI USB Card – 2 ports	(84801)	GST Inc **$44**
USB Network Cable	(B2908)	GST Inc **$75**
USB to Printer Cable	(84803)	GST Inc **$33**
Internal 3.5" USB Hub – 4 ports	(B2909)	GST Inc **$75**
USB to 10/100 Ethernet Adapter	(B2912)	GST Inc **$115**

FireWire for Notebook



Adds two FireWire ports to your Notebook with a Cardbus Type II interface.
- Plug and Play!
- **Free** video capture and editing software.

FireWire to CardBus controller (2 port)
(B9849) GST Inc
$120

KOUWELL PCI SCSI Cards



The easy way to expand your PC. Connect multiple SCSI devices to one card.

PCI Bus, Ultra-SCSI	(90681)	GST Inc **$97**
PCI Bus, Ultra-Wide	(90683)	GST Inc **$175**
PCI Bus, 2 channel Ultra-Wide	(90684)	GST Inc **$375**
PCI Bus, Ultra2-Wide	(90685)	GST Inc **$279**
PCI Bus, Ultra 160	(B9847)	GST Inc **$527**

KOUWELL IDE Acceleration & Expansion Card

ULTRA ATA/100

Speed up your PC's new hard disk drives with this PCI plug in Ultra DMA 100 card. Supports transfer speeds of up to 100MB/s with new ATA100 drives, and includes the ability to run up to 4 extra IDE or ATAPI drives on your system.



PCI IDE Ultra DMA 100 Card	(90688)	GST Inc **$77**
PCI IDE Ultra DMA 100 RAID Card	(B8410)	GST Inc **$110**

NEW LOW PRICE

USB 2.0

Hi-Speed Certified USB

Introducing USB 2.0. Faster than FireWire. Compatible with existing USB peripherals.

5 port Card (B9850)
GST Inc **$139**

4 port Hub (B9851)
GST Inc **$139**

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CD / DVD Production Equipment

PRIMERA TECHNOLOGY, INC. Signature IV CD Printer



- 1200x1200 dpi res
- Fast: 27 seconds per disc.

*RENT: $32.34/WK
(B9917) GST Inc **$3,298**

PRIMERA TECHNOLOGY, INC. Signature Pro CD Printer



- 2400dpi
- Superfast
- Dual Ink Cartridges

*RENT: $40.08/WK (C3681)
GST Inc **$4,289**

PRIMERA TECHNOLOGY, INC. Inscripta Printer



- 610 x 305 dpi Thermal
- Durable finish

*RENT: $54.68/WK (B2932)
GST Inc **$5,999**

PRIMERA TECHNOLOGY, INC. GP Composer CD / DVD Duplicator

GP Composer

- 2 x DVD-R (General Data)
- 1 x DVD-RW
- 8 x CD-R



Automatic DVD and CD Duplication. Choose from one of the optional add on Primera printers as shown on left. Includes DVD and CD mastering software.

*RENT: $74.44/WK (C5561) GST Inc **$8,580**

PRIMERA TECHNOLOGY, INC. Composer CD Duplicator


(Printer & stand not included)

Now 16x! 16x CD-R, 10 x CD-RW, 40 x Read CD Duplication system – 50 disc capacity. Printer optional extra.

Composer 16x CD-R Auto Duplicator
(C5708) GST Inc **$5,435**

PRIMERA TECHNOLOGY, INC. Conductor Printer Autoloader


(Printer & stand not included)

Print up to 50 CD's on your Signature III/IV/Pro or Inscripta without having to manually load the discs!

Conductor Printer Autoloader
(B2934) GST Inc **$3,398**

Unattended Copiers

MICROBOARDS Technology, Inc. Orbit 2 CD Duplicator

Stand Alone CD Duplicator with 1 16x CD-R drive. 50 CD Capacity. An internal CD-ROM Drive holds the master disc being duplicated.

"The Orbit II, aptly billed as "The Office Copier," is built to fit: it's easier to use than a fax machine, it occupies about the same space, and it comes at an alluring list price." Emedia Magazine

Orbit 2 CD Duplicator

*RENT: $66.80/WK
(B9918) GST Inc **$7,699**



MICROBOARDS Technology, Inc. Saturn 2 CD Publishing System

Stand Alone CD Duplictor with 2 12x4x32 CD-RW Drives and in-line colour printer. 150 CD Capacity. Internal 4GB+ hard drive to store your frequently used masters.



Saturn 2 CD Publishing System

*RENT: $147.79/WK (B9919) GST Inc **$18,298**

MultiDrive Towers

Verbatim Viking Express

The Viking Express CD Duplicators provide powerful CD-R production capabilities in a modular system. 4, 6 and 8 master drive controller towers can be matched now or later with a satellite 4 or 8 drive upgrade tower allowing up to a total of 16 drives all recording



Viking Tower Duplicator

4 16x drives	(B9920) GST Inc	**$6,439**
6 16x drives	(B9921) GST Inc	**$7,988**
8 16x drives	(B9922) GST Inc	**$9,534**
4 additional 16x drives	(B9923) GST Inc	**$4,780**
8 additional 16x drives	(B9924) GST Inc	**$7,754**

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CD-R/CD-RW: Storage for life

DataLifePlus CD-R - 10Pack
74 Min. 650MB 1x - 16x 10 pack



(B4329) GST Inc:
$15

DataLifePlus CD-R Audio & CD-RW Audio



74 min recordable
(A2336) GST Inc:
$3
74 min rewritable
(B4327) GST Inc:
$6

DataLifePlus CD-R - Singles
74 Min. 650MB 1x - 16x Singles



(74740) GST Inc:
$2

DataLifePlus CD-R - Inkjet printable
74 Min. 650 MB Printable Surface 1x - 12x, 50 spindle pack



*Printable surface also available in jewel-case

(93471) GST Inc:
$72

DataLifePlus Colours CD-R



80 Min. 700MB 1x - 12x colored CD-R's in matching superslim cases 25 pack
(B1355) GST Inc:
$39

DataLifePlus CD-R - 80 Minute



80 Min. 700MB 1x - 16x 10 Pack
(B4710) GST Inc:
$17

DataLife CD-R



- Third generation Phthalocyanine Recording Dye Technology
- Scratch Resistant Surface

80 Minute DataLifeSlimCase 10 Pack 16x
(C7091) GST Inc: **$15**

80 Minute DataLife Spindle 25 Pack 16x
(C7093) GST Inc: **$35**

DataLifePlus CD-RW
650MB CD Rewritable 2x - 4x 20 pack in slimline cases



2x- 4x 20 pack cases
(C7097) GST Inc:
$69
2x - 4x Singles
(77492) GST Inc:
$4
4x -10x Singles
(B2658) GST Inc:
$5



Did you know... Verbatim DataLifePlus CD's represent the latest in technology. Featuring a proprietary blue Metal-Azo dye which has the best resistance to sunlight, silver reflective layer for optimum read and write performance and multispeed recording.

Accessories

Deluxe
Headset with Mic



- Volume control & on/off switch
- Microphone cover to eliminate distortion

(C2303) GST Inc:
$18

Comfort
Headset with Mic



- Discreet modern shape for easy wearing

(C2304) GST Inc:
$16

Collapsible
Headset with Mic



- Ideal for notebook users.

(77819) GST Inc:
$15

Diskettes

The World's No. 1 Floppy Disk
DataLife Floppy Diskettes



(79452) GST Inc: **$6**

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Swann. More than just modems!



HARRIS TECHNOLOGY for all your computer needs!

SWANNSMART TURBO (B1846) GST INC **$135**

56K V.90 External Voice/Fax/Data Modem

- Intel® modem chipset
- Crystal clear hands free voice transfer
- Includes WebWorks 2000 CD ROM (Value $19.95 RRP)
- 30 Day Swann Satisfaction Guarantee
- 5 year "Hassle Free" warranty



SWANN USB MULTI-HUB (C6793) GST INC **$Call**

USB 4-Port Hub

- Easy and convenient access to USB ports – no need to open your computer to install an adaptor card
- Supports bus-powered and self-powered USB peripherals (including printers, scanners, modems, keyboards and mice)
- Allows "Hot Swapping"
- PC & Mac compatible
- 1 year "Hassle Free" warranty



SWANN MICROCAM (C5312) GST INC **$599**

2.4GHz Wireless Ultra Miniature Camera System

- The ideal discreet security system
- Simple to install, just plug to any video device such as VCR, TV or security monitor and play
- Superior quality CMOS colour lens
- Up to 100m transmission range
- 1 year "Hassle Free" warranty



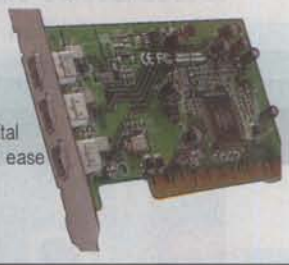
Not all items are in stock at all stores but can be ordered!

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FIREWIRE CONNECTIVITY CARD (C2308) GST INC **$130**

3 Port IEEE 1394 PCI Card

- Up to 400 Mbps data transfer
- Add FireWire capabilities to your computer at minimal cost
- Connect all types of IEE 1394 compliant peripherals including printers, scanners, digital cameras, hard drives and CD burners with ease
- Hot plug connectivity – simple, automatic installation
- 1 year "Hassle Free" warranty



SWANN USB SMARTCAM DELUXE (C6794) GST INC **$119**

USB Web Cam

- Easy installation. Just plug and play!
- 640 x 480 VGA resolution
- Up to 30 frames per second
- PC & Mac compatible
- 1 year "Hassle Free" warranty

(Web Cam case colour may vary)



Swann also stocks a range of quality accessories for your Palm™ organiser, including our highly popular Screen Protectors, which protect your Palm™ from dust, moisture and scratches.

Internet: www.swann.com.au Tech Support: 1300 13 8321 or tech@swann.com.au

Quicken

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Web Direct www.ht.com.au/cat/quicken

Money management made easier!

Quicken Game Pak Deluxe



Transform your hand-held organiser with 2 dozen games plus a daily crossword puzzle!

(C4291) GST Inc: **$19**



(C2379) GST Inc: **$224**

Quicken QuickBooks V8

"With The Simplified BAS"

Upgrade to V8 before the 30th of September and receive $75 cash back from Quicken by redemption*

**(conditions apply)*

QuickBooks is now ready for you to use the simplified BAS in your Business. It is the easy way to keep track of your company's bank balances, loans and other finances. Calculate charges on overdue payments, monitor unpaid bills, write and print cheques. Manage inventory and code each and every transaction to make it easier to manage your business. With 'one click' BAS reporting from the integrated QuickBAS, the GST is easy to manage too. Productivity gains will be augmented with up to 79 different financial graphs and reports. QuickBooks also includes QuickBooks Online Banking, Australia's first fully integrated online banking interface.



(C7329) GST Inc: **$287**

QuickTrack Solutions™ V3

"QuickBooks goes mobile!"

You've just finished a job on site. With QuickTrack you can prepare and print the invoice and hand it to your customer on site with your handheld PC! Easy! No need to update your accounting software from hand written invoices at night. Instant access to your invoices, quotes, stock, purchase orders, customer and supplier details wherever you are. The whole days work uploads to your PC with the touch of a button.

- Includes 7 essential business modules from QuickBooks PRO.
- Prepare invoices, quotes, raise purchase orders, stocktake and check customer, supplier and product details instantly
- Print on site (optional printer required)
- HotSync® to update QuickBooks automatically!

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Pioneer

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Web Direct www.ht.com.au/cat/pioneer

Multimedia: DVD-R, DVD-ROM & BLANK MEDIA

Pioneer DVR-A03 DVD-R/RW DRIVE

One drive... One complete recording solution



DVR-A03 (C3847) GST Inc: **$2,078**

Fast Delivery Australia-Wide

Web Direct

See Web Direct Link (at top of page) for more products and latest info!

Features	Writes:			Features	Reads:
• DVD-R	(2x)	• CD-R	(8x)	• DVD-ROM, DVD-Video,	
• DVD-RW	(1x)	• CD-RW	(4x)	• DVD-R, DVD-RW,	
				• CD-ROM, CD-R, CD-RW,	
				• CD-TEXT, Photo CD, Audio CD	

Includes

- 2 x DVD-R Media
- 5 x CD-R Media
- SONIC DVD Authoring Software
- VOB DVD/CD Writing Software
- STAEDTLER LUMOCOLOR pen
- Power DVD software decoder

DON'T FORGET your Fly Buys points!

Pioneer DVD-R Media

• Jewel Case • Memory-capacity of 4.7GB • Suitable for DVD Video & Data backup • Playable on both DVD-Video players & DVD-ROM drives • Commercial and Home DVD-Video production • Large sized data archive storage

(not for use with Pioneer DVRS201 authoring drive)



DVS-R470SDF (B9971) GST Inc: **$26**

DVS-RP470SDF (C2322) GST Inc: **$29**

• White printable version

Pioneer DVD-RW Media

Rewritable DVD media : Jewel case : Memory capacity of 4.7GB: Suitable for DVD video & data : (not for use with Pioneer DVR-S201 authoring drive, does suit Apple G4 "Superdrive")



DVS-RW470SD

(C2326) GST Inc: **$59**

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YAMAHA CDR SOLUTIONS



YAMAHA CRW2200 Series

Yamaha now provides the world's fastest and most reliable CD recording. At speeds up to 20x but with Yamaha's proprietary SafeBurn technology, Buffer underrun is eliminated but in a virtually undetectable way that ensures your disc integrity. Combined with Yamaha's huge 8 MB buffer and Optimum Write Speed Control, you can be guaranteed the best quality burn at the optimum speed for your media.

CRW2200EVK
The CRW2200EVK is a complete E-IDE/ATAPI kit to go in an internal PC bay. With award-winning Nero V5.5 software, cables, manuals, screws and 700 MB blank CDR and CD-RW discs.
(C7211) GST Inc: **$569**

CRW2200SVK
The CRW2200SVK is an internal SCSI kit with Nero V5.5 software and utilities, cables, manuals and blank 700 MB CDR and CD-RW discs.
(C7212) GST Inc: **$664**

CRW2200SXVK
An external SCSI drive with all the speed of the 20x internal unit. With Ahead software for PC and Macintosh, blank discs and manuals.
(C7214) GST Inc: **$799**

CRW2200IXVK
An external drive with a Firewire / IEEE1394 interface. With Ahead software for PC and Macintosh, blank discs and manuals. This unit offers speed and flexibility & true "plug and play" capability. With Firewire cable.
(C7219) GST Inc: **$899**

CRW2200UXVK
The latest external interface is finally here; USB V2.0 is compatible with USB V1.1 PC's but really cooks at V2.0 speeds. With the Mac and PC software from Ahead (Nero, Mix, Max and utilities).
(C7224) GST Inc: **$799**

Web Direct
See Web Direct Link (at top of page) for more products and latest info!

YAMAHA PC SPEAKERS



YSTM101

NEW compact speaker pair. Bass to 80 Hz! 6 Watts RMS Total Modern, sleek design. Shielded. Headphone jack White colour only.
(C7202) GST Inc: **$69**



YSTMS201

NEW 3-Piece system with Subwoofer. 30 Watts RMS Total - 2 x 6W Satellites, 18W Subwoofer Wooden subwoofer. Shielded. Active Servo Bass to 45 Hz!! White colour only.
(C7204) GST Inc: **$119**

YSTMS55D

Satellite/Sub "Killer" system, with 80 watts RMS. 20W and 20W (left and right) and 40W SubWoofer. 2 Analogue & 1 USB input. White or black in colour. black(81346)



(white 81345) GST Inc: **$277**

NEW

TSS1 Digital Surround System



Yamaha Home theatre system at awesome pricing! A true Dolby Digital decoder with 48 Watts RMS Total power, 5 speaker cubes and subwoofer.
Digital input for Playstation 2, DVD player or Digital soundcard. Also includes standard inputs from 2-channel or 4-channel soundcard. Black or White.

Black (B9967) GST Inc: **$449**
White (C2072) GST Inc:

Yamaha audio quality makes such a difference to your desktop!

Model:	YSTM8	YSTM40	YSTMSW10
Descript:	Full range powered monitor speaker pair	Quality desktop pair.	Powered subwoofer wooden cabinet
Watts:	2x 5w	2x 12w speakers	25w
Features:	Ashtonishly deep bass. Subwoofer and headphone output jacks. Dual stereo inputs.	Dual analogue inputs. Advanced servo Technology for deeper bass.	Incredible audio depth, auto on/off Chest-thumping bass response down to 35Hz.
White:	(81339)	(99555)	(81350)
Black:	(81340)	(99556)	N/A
	GST Inc: **$85**	GST Inc: **$109**	GST Inc: **$170**

Wine on-line?
Vintage Cellars
vintagecellars.com.au

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Professional Video Tools

canopus

New Product!

DVRaptorRT

Real Time for Real Editors

A high-performance single slot solution with impressive capabilities such as Multiple Real Time Video Tracks, Filters, Transitions & Titles; Real Time Analogue Output; Mpeg 1&2, DVD, SVCD, VCD and Web Streaming!!! Scalable Technology - More CPU Power = More Real-Time Capabilities.



DVRAPTOR-RT WITH PREMIERE v6
(C6461) GST INC **$1,499**

DVRAPTOR-RT
FOR EXISTING PREMIERE 6.0 USERS
(C5577) GST INC **$1,199**

DV STORM ULTIMATE DVDR BUNDLE!!!

NEW

Includes StormBay, StormEdit, Xplode-Professional, Boris Graffiti, Acid Style. SpruceUp (FULL VERSION), Web Video Wizard & Pioneer DVDR IDE burner and 2 bonus blank DVDR media.

with Storm Edit
(C7549) GST INC: **$4,999**RRP

with Premiere v6
(C7550) GST INC: **$5,299**RRP



Now you can collect Fly Buys points when you purchase from HARRIS TECHNOLOGY.

DV STORM



Render-free, real-time digital video editing, DV and Analogue input/output, MPEG output for DVD, Web streaming capabilities - the ultimate digital video editing experience!

with Storm Edit
(B4401) GST INC: **$2,949**

with Premiere v6
(C0025) GST INC: **$3,299**

Ask About... EXTENDED HARRIS WARRANTY

DVBooster Pack

(Adobe Premiere 6 Plug-In)



This pack enhances your ability to create visually stunning videos with Canopus' high-quality 3D transitions and optimized filters. Combining features which offer editing flexibility and functionality, speedier video productions, output to MPEG 1/2 and streaming video files, the Booster Pack becomes an essential tool and a must have for today's DV editor. Compatible with all Canopus or other editing systems that support Adobe Prem 5.1/6 or Ulead MSP 6.

DVBOOSTER PACK (C5579) GST INC **$479**

EZDV

Bullet-proof,high speed Canopus DV codec. Precise, fast MPEG 1&2 encoding straight from the editing timeline.

with EZ Edit
(97877) GST INC: **$499**

with Premiere v6
(C0023) GST INC: **$799**

JD-1 Jog Shuttle Controller

A professional jog/shuttle controller compatible with all Canopus or other editing systems that support Adobe Prem 5.1/6 or Ulead MSP 6. JD1 gives you quicker, more intuitive editing and ease of use by combining keyboard sequences and mouse functions into one unit.



Connecting via USB it is very simple to install and so compact it will integrate into even the smallest work environment.

JD-1 SHUTTLE & JOG
(C5578) GST INC **$375**

Xplode Professional

(Adobe Premiere 6 Plug-In)



Arming video editors with the power to create stunning, professional-quality video content, Xplode Professional is a highly developed 3D video effects package featuring Canopus' powerful Xplode technology. Offering hundreds of customizable effects and transitions, acceleration via the support of third-party graphics boards and SmartConfig an intuitive interface that makes creating custom effects a snap. Compatible with all capture cards.

XPLODE PROFESSIONAL (C5580) GST INC **$725**

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PCI (B2593) GST INC **$669** (*Conditions apply)



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HAUPPAUGE TV	(89063)	GST INC	**$135**
HAUPPAUGE TV GO - FM	(89064)	GST INC	**$179**
HAUPPAUGE TV USB	(89066)	GST INC	**$255**
HAUPPAUGE TV USB - FM	(98455)	GST INC	**$275**

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PRINTER OPTIONS

ML6060

550 PAGE CASSETTE (C1803) GST Inc **$255**

PS III CARD (C1804) GST Inc **$254**

ML6060 & ML7050

NETWORK 10/100 (C1805) GST Inc **$399**

ML7050

500 PAGE CASSETTE (C1806) GST Inc **$272**

ML7050 RS232/ LOCALTALK (C1807) GST Inc **$162**

Laser Printer

ML4500

Personal Printer



- Excellent printing 8ppm Printing Speed
- Real 600 dpi resolution
- 35MHz High Performance RISC Processor
- Economic Printing -Toner Save Button: 30% Toner saving a year, print -N-up Printing (Multi-page printing on one sheet)
- Cancel/Reprint Button
- 150 Sheet Multi-purpose input Tray
- Extra sheet feeder for envelopes, labels, card stock, or transparencies

ML4500 (C1795) GST Inc **$496**

Toner Drum Cartridge

(2,500 pages at 5%) (C1799) GST Inc **$128**

Laser Printer

ML5200A

Personal Printer



- Fast 10ppm printing speed
- 1200dpi class outstanding resolution with SRT
- HP PCL 6 compatible emulation
- Various 45 scalable fonts including 10 true type fonts
- One piece integrated toner & OPC imager of 6000 pages at 5% coverage
- Easy to use, easy installation - easy connection
- Stable paper handling & versatile media and paper size

ML5200A (C1796) GST Inc **$684**

Toner Drum Cartridge

(6,000 pages at 5%) (C1800) GST Inc **$180**

Laser Printer

ML6060

12PPM Printing Speed



- Instant on Fuser prints First Page in 15 Seconds
- 4MB DRAM (up to 68MB):ML-6060
- 1200 DPI with SRT Rand SGT R
- Toner Save Button & Reprint button
- 550 Sheet cassette bank (optional 550 sheet)
- Sufficient Memory of Standard 4MB with SMET Rand Greater Maximum Memory Capacity of 68MB.
- Network Option.

ML6060 (C1797) GST Inc **$885**

Toner Drum Cartridge

(6,000 pages at 5%) (C1801) GST Inc **$180**

• SRT R(SAMSUNG Resolution Technology) • SGT R(SAMSUNG Gray Technology)

Laser Printer

ML7050

Superior Printing Performance



- 17PPM Printing Speed on Letter-size Sheets
- New High Performance Controller based on Motorola PowerPC 603e 100Mhz Processor
- Instant on Fuser prints First Page in 13 Seconds
- Duplex Mechanism Built-in, need no Extra Charge
- Flexible Paper Handling
- 600 sheets Standard with Two Input Sources
- 500 sheets Universal Cassette Handles Various Sheet Size from letter to Executive
- Network Option.

ML7050 (C1798) GST Inc **$1,454**

Toner Drum Cartridge

(8,000 pages at 5%) (C1802) GST Inc **$249**

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150B2B 15" LCD Monitor

Also availabe in black colour

(C7338)GST Inc: **$Call**

- 15" colour LCD monitor
- max resolution: 1024x768 at 75Hz
- Adjustable tilt and swivel function
- Optional multi-media base
- pixel pitch: 0.297 x 0.297mm
- VGA input
- AUTO adjustment



150P2E 15" LCD Monitor

Also availabe in beige colour

(C7339) GST Inc: **$Call**

- 15" colour LCD monitor
- pixel pitch: 0.297 x 0.297mm
- max resolution: 1024x768 at 75Hz
- Rotation for both PORTRAIT and LANDSCAPE display
- Dual input - accepts both DVI Digital and VGA inputs
- Linear height adjustment for best viewing position
- AUTO adjustment
- Optional multi-media base

Philips 3 Year Parts & Labour Warranty*
* Conditions apply

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New Sound Card Just Launched In Australia!



(C7336) GST Inc: **$249RRP**

- **PSC706 PCI sound card** capable of playing all movies, games, and music in fully accelerated true 5.1 surround sound to ensure the ultra realistic surround sound experience
- Turns all stereo sources into, distinct 5.1 channel channels, using patented QSound algorithm
- SPDIF in/out for connection to external equipment
- Includes: Dolby Digital™ /AC3 compatible PowerDVD™ player software
- Hear up to 96 distinct high-impact 3D sound from games, movies, music and external sources using two, four, or six speakers.
- Included software: QSound AudioPix™, Sonic Foundry® SIREN Xpress™, Acid XPress™



(C7337) GST Inc: **$199RRP**

- **PSC705 PCI sound card**
- Turn any stereo source into 5.1 surround sound.
- Play all games in 5.1-channel surround sound, including EAX™ 2.0, A3D™ 1.0 and even ordinary stereo games!
- Full compatiblility with EAX™ 1.0, EAX™ 2.0 and A3D™ 1.0 games
- Hear up to 96 distinct high-impact 3D sound from games, movies, music, and external sources using two, four, or six speakers. It sounds like you are in the game or concert
- Included software: Sonic Foundry® SIREN Xpress™, Acid XPress™, QSound AudioPix™

Speaker Range



(C7334) GST Inc: **$299**

- ANALOGUE MULTIMEDIA MULTI-CHANNEL SPEAKER SYSTEM
- Active 80 watts (RMS) Total Power
- wOOx (TM) Bass Driver Technology
- Soft Flat Panel Satellite Speakers
- Wireless Remote Control with patented technology
- Digital Sound Control for Game / Speech/ Music
- Input Selector - choose up to 3 audio sources at the same time
- Easy placement speakers - vertical / horizontal / wall mountable
- Magnetically shielded



(A8907) GST Inc: **$99**

- ANALOGUE MULTIMEDIA SPEAKER SYSTEM
- Active High Power - 20 Watts(RMS) - 3 piece speaker system for PC, CD player and other audio video sources
- rich deep bass
- "Bass Boost"
- Magnetically Shielded
- Compact Powerful Subwoofer
- High Clarity Satellite Speakers
- Remote Control

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BUSLINK 3.5' EXTERNAL USB HARD DRIVE



USB 20GB (C3818) GST Inc: **$495**

USB 40GB (C5602) GST Inc: **$770**

USB 60GB (C5603) GST Inc: **$880**

USB 80GB (C3819) GST Inc: **$995**

BUSlink USB Hard drive is a fast, easy way to add additional storage to your computers. Reliability and design: BUSlink USB Hard Drives feature tough alloy enclosures, and are designed to be stackable. And they're built to last, with an MTBF (Mean Time Between Failures) of 300,000 hours.

- Data transfer rate up to 8Mb/sec.
- Easy system backup and disaster recovery
- Connects via USB port
- One year limited warranty
- Compatible with Windows 98, 98SE, ME & 2000

BUSLINK'S CD-REWRITABLE DRIVE



(C3821) GST Inc: **$495**

BUSlink's CD-Rewritable Drive allows you to write and rewrite data files. To record your favourite music CD, to copy other CDs, and to backup your important files with unsurpassed reliability, do it all, with BUSlink's CD-Rewritable Drive.

- Adaptec's Easy CD Creator & Direct CD software included
- Writes CD-R & CD-RW at 4x
- Reads at up to 6x max.
- Data transfer rate up to 8Mb/sec.
- Converts MP3 files into audio CD's
- Easy system backup and disaster recovery
- Connects via USB port
- One year limited warranty
- Compatible with Windows 98, 98SE, ME & 2000



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Notebook Security

Defcon™ CL

The Targus DEFCON CL Cable Lock utilises 2.0m of cut-resistant, galvanised steel cable to attach your notebook to any secure object. Simply loop the lock around a desk or chair, insert DEFCON CL into your notebook's lock slot and set the combination. With up to 10,000 user-settable combinations, DEFCON CL is the first notebook security product to offer the benefits and convenience of a keyless solution.



(81511) GST Inc: **$39**

Defcon™ 3

The Targus DEFCON 3 security system combines the convenience of a remote with the power of a 94 decibel alarm. Simply attach the unit to your computer carry case via the stainless steel cable and arm the system via your remote. DEFCON 3 triggers the alarm when the cable is tampered with or the item is moved. With the DEFCON 3, peace of mind is just a click away.



(C3814) GST Inc: **$88**

Defcon™ 1

The Targus DEFCON 1 is a revolutionary anti-theft system that guards your notebook in more locations and situations than any other device you can buy. The DEFCON 1 combines a stainless steel cable with advanced motion sensor technology to create a combination locking system that easily attaches to your notebook or carrying case.



(66929) GST Inc: **$73**

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Share Moments. Share Life™

Kodak DX3600

NEW!



Looking to go digital? Look to the simple-to-use KODAK DX3600 Digital Camera with Kodak easy share dock system. Get crisp, vibrant prints up to 8" x 10" thanks to its 2.2MP resolution and 3X digital zoom. Start shooting right away with 8MB of internal memory. Want to take more pictures? The DX3600 comes equipped with a COMPACTFLASH Card expansion slot so you can boost your camera's memory capacity. One touch. That's all it takes to get pictures from your KODAK DX3600 Digital Camera to your computer. Place your DX3600 camera in its Dock, press the button, and you're ready to print and e-mail with ease. You'll never miss a picture-taking opportunity since your camera batteries are recharged every time you rest the camera in the Dock.

- KODAK Picture Software lets you instantly view, edit, e-mail, and print your pictures.
- Get great-looking prints with 2.2MP resolution, 2x optical Zoom and 3X digital zoom.
- Handles like a point-and-shoot.
- Get shooting right away with 8MB of internal memory.
- Continuous Video/movie mode and sound.

Recording time only limited by the size of the compact flash being used

KODAK DX3600 (C5964) GST Inc: **$779**

Kodak MC3 portable media device



All the multimedia you've ever wanted in one little player. Click into digital video mode to shoot funny movies or snap a few digital pictures. Download your favorite MP3s and take them with you, listening via ear buds or through your boom box or car stereo. It's one of the only MP3 players with a reflective color preview screen, so you can use it even in bright sunlight. Transferring to your PC is a breeze. It even lets you combine your pictures, music and video into unique music videos.

(B9818) GST Inc: **$389**

Kodak DX3500



Simple-to-use KODAK DX3500 Digital Camera with Kodak Easy Share Dock System. Get crisp, vibrant prints thanks to its 2.2MP resolution and 3X digital zoom. The DX3500 comes equipped with a COMPACTFLASH Card expansion slot so you can boost it's memory capacity.

- KODAK Picture Software lets you instantly view, edit, e-mail, and print your pictures.
- Get great-looking prints with 2.2MP resolution and 3X digital zoom.
- **BONUS 10MB COMPACTFLASH card.**

KOKDAK DX3500 (C2151) GST Inc: **$659**

BONUS 10MB COMPACT FLASH CARD with the DX3500 Camera while stocks last or until further notice.

Kodak DC5000



Rugged, durable, and easy-to-use, the KODAK DC5000 will help you get the job done. The DC5000's weatherproof body will hold up under the toughest circumstances. Two-megapixel resolution provides you with excellent picture quality even on 8" x 10" prints. The 2X optical (30 – 60 mm) and 3X digital zoom let you choose wide angle or telephoto to take pictures in a variety of open spaces. A practical, intuitive package that is easy to use but tough on the job

(A3540) GST Inc: **$999**

Kodak DX3900 NEW!



Set your own color mode, ISO, and lighting exposure settings to get your perfect picture. Thanks to 3.1MP resolution, you'll get excellent picture quality on prints up to 11" x 14". The DX3900 comes with 6X zoom (2X optical and 3X digital) and a COMPACTFLASH Card to keep you shooting longer. And with the DX3900's optional telephoto, wide-angle, and up-close lens attachments, you can extend your creativity.

(C7689) GST Inc: **$1,149**

Kodak PPM200 printer



The most distinctive feature on the Personal Picture Maker 200 is its 1.8-inch, full-colour, LCD preview screen just like those on digital cameras. You don't even need to be connected to a PC, you just insert a memory card from a digital camera (the PPM200 accepts both Smart Media and Compact Flash formats) to print. The preview screen allows you to scroll through all the images on the card, select those to print, choose the number of copies, and in what size and layout. Compatible with Microsoft Windows 98 and Millennium Edition, it connects easily via a USB port.

(B3084) GST Inc: **$539**

Kodak DC3200



Capture fun and spontaneity with the DC3200. One megapixel resolution means eye-catching e-mails and prints up to 5" x 7". Its 2X digital zoom delivers great detail. Two megabyte internal memory and COMPACTFLASH Card capability keeps you shooting longer. And its LCD screen lets you preview your pictures with ease.

(B1255) GST Inc: **$374**

KODAK ACCESSORIES

Premium Camera Bag (82273) GST Inc: **$49**

80 Minute CDR (B3071) GST Inc: **$3**

80 Minute CDR 10 Pack (B5210) GST Inc: **$21**

KODAK PICTURE CARDS

32MB Picture Card (62677) GST Inc: **$75**

64MB Picture Card (82249) GST Inc: **$144**

96MB Picture Card (88332) GST Inc: **$217**

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SENSATIONAL NEW PRODUCT - S600

- Four individual ink tanks with low-ink sensor
- Up to 15 ppm black / 10ppm color
- 2400 x 1200 dpi in color (38% greater than 2880 x 720 dpi)
- 8" x 10" photo in approx. 90 seconds
- Advanced MicroFine Droplet Technology™ for exceptional photo-image quality
- Compatibility: Windows® 95/98/2000, Windows NT® 4.0, Windows Me and Mac® OS 8.1 or later

2400x1200dpi
(C4013) GST INC
$499



PRINTERS



360x720dpi
(A1792) GST INC
$108

BJC-1000SP Bubble Jet Printer
- Outstanding operating economy.
- Vivid colours, even on plain paper.
- Exceptional photographic quality.
- Automatic image improvement.
- Banner printing and outstanding versatility.



360x720dpi
(A3173) GST INC
$147

BJC-2100SP Bubble Jet Printer
- New Super Economy mode cuts operating costs by up to 75%.
- High speed printing, up to 5 ppm black text and up to 2 ppm colour.
- Optional colour scanner.
- Now with parallel port.



1440 X 720dpi
(B9834) GST INC
$224

S400 Bubble Jet Printer
- Super-high resolution, up to 1440 x 720 dpi.
- Brilliant colour inks.
- Operating economy.
- Extraordinary photo printing.
- Optional colour scanner cartridge IS-32.



1440x720dpi
(B9838) GST INC
$637

S4500 Bubble Jet Printer
- Print speeds up to 9 ppm in black text & up to 6 ppm in colour text & graphics
- Print **A3**, new brilliant inks.
- Separate ink tanks for each colour.
- Parallel connectivity for Windows 95/98/2000/ME.
- Optional IS-32 scanner cartridge.



1200x2400dpi.
(B9836) GST INC
$559

S800 Bubble Jet Printer
- Photo Lab printing for the desktop.
- Printing resolutions up to 2400 x 1200 dpi.
- Separate ink tanks for each colour.
- Includes Photo Optimiser Pro and Photo Record image browser software.



600x600dpi.
(C3917) GST INC
$509

LBP810 Printer
- High resolution 600 dpi printing for crisp text and graphics.
- 8 ppm engine speed.
- Wide media compatibility, print transparencies, envelopes, postcards etc.
- Outstanding line definition - equivalent to 2400 dpi horizontally.
- Parallel & USB connections for wide compatibility.

SCANNERS



300x600dpi
(A8919) GST INC
$109

N340P Flatbed Scanner
- Optical resolution is 300 by 600 dpi with selectable resolution up to 2400 dpi.
- 14 Bit colour input.
- ScanGear Toolbox for easy copy, fax and e-mail operations.
- Simple parallel connection for wide compatibility.



600x1200dpi
(A7655) GST INC
$139

N640P Flatbed Scanner
- Optical resolution is 600 by 1200 dpi with selectable resolution up to 9600 dpi.
- Revolutionary 39 mm thick design.
- ScanGear Toolbox for easy copy, fax and e-mail operations.
- LIDE Technology for distortion free scanning.



600x1200dpi.
(A3522) GST INC
$169

N650U Flatbed Scanner
- 600 x 1200dpi optical with selectable resolution up to 9600dpi.
- 42 bit input colour depth.
- New Z-lid for scanning thick items.
- Front panel button and software for simple e-mail, fax and copy operations.
- Powered and connected by USB for Windows 98/2000 or Mac OS 8.5+.



1200x2400dpi.
(C7589) GST INC
$289

N1240U Flatbed Scanner New
- Amazing 1200 x 2400dpi optical with selectable resolution up to 9600dpi.
- Stylish charcoal and aluminium finish.
- New Z-lid for scanning thick books etc.
- Software for Windows & Mac including OmniPage and PhotoShop Elements.



1200x2400dpi.
(B9935) GST INC
$389

CanoScan D1230U Flatbed Scanner
- A4 1200x2400dpi flatbed scanner - optional 1200x2400dpi film scanning.
- Fast one pass USB scanning.
- Stylish charcoal grey and aluminium design.
- Includes Adobe PhotoShop 5.0LE & OmniPage OCR software for Win. and Mac.



2400x4800dpi.
(B9840) GST INC
$759

CanoScan D2400U Flatbed Scanner
- Optical resolution of 2400 x 4800 dpi.
- Film adaptor lid - for accurate scanning of 35mm, 2¼" and 4"x5" film.
- Outstanding colour accuracy.
- Ideal for professional studios, graphics and design bureaus.



PowerShot A10 DIGITAL CAMERA
(C3968) GST INC
$685



PowerShot A20 DIGITAL CAMERA
(C3864) GST INC
$874



PowerShot DIGITAL IXUS-V
(C5389) GST INC
$1,174



PowerShot DIGITAL IXUS 300
(C5653) GST INC
$1,295 RRP

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HP DesignJets

HP DesignJet 500

Professional graphics printer for 24" wide photo quality ads and graphics.



RES: 1200x600dpi
SPEED: D size line drawings (sec): fast 90/normal 195/ best 360
Colour images (sq m/hr): 7.9 fast/ 3.3 normal/ 2.0 best
MEDIA: Coated & glossy paper,technical media. Sheet & roll feed,auto cutter
SIZES: Sheet: 211mm- 610mm (w) x 211-1897 (l); Roll: 24" (w) x 45.7m (l)
I/FACE: Parallel, USB
SIZE: 1.2 x 0.49 x 0.36m; 38.6kg

	Rent*	Part #	GST Inc:
HP DesignJet 500 24"	$38.59	(A7234)	$4,130
HP DesignJet 500PS 24"	$51.18	(A7233)	$5,289
HP DesignJet 500 42"	$57.87	(B1178)	$6,288
HP DesignJet 500PS 42"	$67.07	(B8498)	$7,285

FREE PRINT SAMPLE!! GO TO www.ht.com.au

HP DesignJet 800

Professional graphics printer for 24" wide photo quality ads and graphics.



RES: 2400x1200dpi
SPEED: Prints times as short as 60 seconds (D size prints)
MEDIA: Coated & glossy paper,technical media. Sheet & roll feed, auto cutter
SIZES: Sheet: 610mm- 1897mm ; Roll: 24" (w) x 45.7m (l)
I/FACE: Parallel, USB
SIZE: Printer in 2 sizes 42 or 24 Inches wide

	Rent*	Part #	GST Inc:
HP DesignJet 800 24"	$85.89	(B8514)	$9,482
HP DesignJet 800PS 24"	$122.24	(B8518)	$13,674
HP DesignJet 800 42"	$97.16	(B8513)	$11,178
HP DesignJet 800PS 42"	$135.12	(B8519)	$15,770

Web Direct
See Web Direct Link (at top of page) for all your HP ink & paper needs!



HP DesignJet 5000

Professional graphics printer photo quality unmatched by any other printer

Come in & see one on display @ our Nth Ryde Location!



RES: 1200x600dpi on glossy media (6 colours:CMYKcm)
SPEED: max: 46.4 sq m/hr, at max quality 8.27 sq m/hr, at productivity 6.32 sq m/hr
MEDIA: Coated & glossy paper, backlit, opaque, vinyl, canvas...
SIZES: Sheet: 211mm- 914mm (w) x 559- 1600mm (l); Roll: 24/36/42" (w), up to 91.4m (l)
I/FACE: Parallel, HP JetDirect 610N 10/100 Base TX Print Server
SIZE: 2.0 x 0.69 x 1.3m: 100kg

	Rent*	Part #	GST Inc:
HP DesignJet 5000 42"	$158.22	(B6514)	$19,203
HP DesignJet 5000PS 42"	$207.81	(B9792)	$25,225
HP DesignJet 5000 60"	$252.25	(B6515)	$30,622
HP DesignJet 5000PS 60"	-	(B9791)	$37,785

RENTSMART

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The figures quoted are based on a per week basis over 3 years. T.A.P, Terms & Conditions apply.

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LaserJet Printers

HP LaserJet 6L Pro

(B4399) GST INC **$587**

• 6ppm • economode cuts printing costs by 50% • power save mode reduces energy costs • 18-second first page out • patent instant-on fuser eliminates printer warm-up time • fast return to application • supports a wide variety of media sizes and types (letter, envelopes, transparencies and card stock) • Supports DOS and Windows 3.1, 3.11,95,98,NT 4.0 environments



Buy a HP LaserJet 6L Pro Printer between 1 May & 30 October 2001 & **receive an additional HP Black Toner cartridge for FREE***

*Conditions apply, customers must fill out a redemption form, form available via www.hp.com.au/HPPromotions/

HP LaserJet 1200 Series

LaserJet 1200 (base unit) (B9799) GST INC **$765**

LaserJet 1200n (B9958) GST INC **$1,279**

• 14 ppm A4 (best-in-class) and first page out in less than 10 seconds •increased memory of 8MB of RAM (upgradable to 72 MB) •protected 250-sheet input tray and 10-sheet priority feed tray •improved duty cycle of up 10,000 pages •instant-on fuser eliminates warm up time

LaserJet 1220 (B9968) GST INC **$917**

You can now enjoy the comfort of printing, colour scanning and copying from one machine by simply adding the copier/scanner attachment to your hp LaserJet 1200. Beside enjoying all the best-in-class printing capabilities of the hp LaserJet 1200, you can now take control of your document management with the added benefit of colour scanning and copying.

Buy a HP LaserJet 1200 Printer between 01 Aug & 30 Sept 2001 & receive **$100 CASHBACK***



HP LaserJet 2200 Series

LaserJet 2200d (base unit) (B9956) GST INC **$1,519**

LaserJet 2200dn (B9957) GST INC **$2,009**

LaserJet 2200dtn (B9898) GST INC **$2,559**

• Improved productivity with faster printing at 18 ppm A4 •best printing resolution of true 1200 x 1200 dpi at full speed •quicker return to application with 133 MHz processor • first page out in 15 seconds with instant on-fuser •print large and complex documents quickly and easily with 8 MB of standard memory (16 MB memory on hp LaserJet 2200dtn) – expandable up to 72 MB •increased duty cycle to 40,000/month

BUY FOUR HP LaserJet 2200 Printers between 01 Aug & 30 Sept 2001 & claim a **FREE* Business InkJet 2200***



HP LaserJet 4100 Printer

LaserJet 4100 (base unit) (B8399) GST INC **$2,184**

LaserJet 4100n (B8400) GST INC **$2,945**

LaserJet 4100tn (B8401) GST INC **$3,419**

LaserJet 4100dtn (B8402) GST INC **$3,949**

• Super fast printing at 24ppm A4 print • 250MHz processor ensures quicker return to application • complex documents print faster with 16MB/32MB memory • 12 second first page out • HP Pro-Res & FastRes 1200 dpi print quality at full speed • dynamic RIP-once for faster processing of multiple original prints • duty cycle of 150,000 pages/month



Buy THREE HP LaserJet 4100 Printers between 01 Aug & 30 Sept 2001 & claim a **FREE* Business InkJet 2200***

HP LaserJet 3200 Series

LaserJet 3200 (C2332) GST INC **$1,449**

LaserJet 3200M (C4456) GST INC **$1,604**

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HP LaserJet 8150 Series

HP Laserjet 8150 (B1981) GST INC **$4,344**

HP Laserjet 8150DN (B1982) GST INC **$5,682**

HP Laserjet 8150N (B1986) GST INC **$4,960**

The new HP LaserJet 8150 series is designed to grow with your business and its needs. It delivers high-volume, high-speed black and white prints and copies for small workgroups to large departments. • Fast printing at 32 ppm; 32 Mb ram (expandable to 150 Mb); 300 MHz processor.

Buy THREE HP LaserJet 8150 Printers between 01 Aug & 30 Sept 2001 & claim a **FREE* Business InkJet 2200***



HP LaserJet 4550 Series



HP Colour Laserjet 4550 A4 16PPM 64Mb (B2381) GST INC **$3,944**

HP Colour Laserjet 4550N A4 16PPM 64Mb 10/100 (B2382) GST INC **$4,469**

HP BUSINESS INKJET 2200 SPECS:

Model # C3906A Superfast color, 15ppm black, 14ppm color, up to 1200 x 600dpi black & PhotoREt 3 color (up to 1200 x 600dpi), 8MB RAM, 250 sheet bin, 10,000 page duty cycle, ECP Parallel (IEEE 1284) B-type interface

ALL HP PROMOTIONS

*Conditions apply, customers must fill out and send a redemption form to receive. Form & conditions available via www.hp.com.au/HPPromotions

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HP Scanjets, OfficeJets & DeskJets

HP ScanJet 5470c

HOT NEW PRODUCT

Superior scans at a touch High-performance, 2400 dpi scanner for professional use. Image resolution up to 2400 dpi with true 48-bit colour •HP 's exclusive dual sensor CCD (charge coupled device) technology brings you exceptional crisp and sharp scans up to 2400 dpi resolution •true 48-bit colour depth delivers true-to- original, colour-rich images •no compromise on speed with preview scans in as little as 8 seconds



(C7652) GST INC **$599**

HP ScanJet 4400

HOT NEW PRODUCT

HP's exclusive scanning software automatically optimises scanned photos, converts black-and-white line art into infinitely scalable vector files and automatically creates editable text from scanned documents with a simple drag-and-drop, copy and paste or scan to. If you want the flexibility to adjust scanned images on your own, you can do that, too.



(C5904) GST INC **$295**

HP PSC 750 Printer-scanner-copier

Ideal for: Busy families that need convenience and quality Savvy users with limited work space Students who want to get creative with cards, newsletters and more benefits: Make quick color copies at home from 3x5 inches up to 8.5x11 inches Scan your favorite snapshot to e-mail friends and family Print on photo paper to put in your photo album



HOT NEW PRODUCT

(C7655) GST INC **$799**

HP OfficeJet T65

All In One Scanner/Printer/Fax/Copier • Up to 11ppm mono and 8.5ppm colour •75 page memory •Colour fax capability • 100 speed dials with 10 one-touch keys • junk fax barrier, 20 group speed dials fax forwarding • Colour scanning - up to 1200dpi enhanced 300 x 600 optical 24 bit colour • walk -up colour copy



(84893) GST INC **$445**

HP OfficeJet G85

All Colour: Printer, Copier, Scanner & Fax Prints at up to 12 ppm black, 10 ppm color using 2400x1200dpi colour with HP photoREt 3, as well as flatbed 36-bit scanning, faster copying speeds, and upgradeable networking capability which allows one unit to be shared by several PCs. Each model combines a color printer, scanner, copier and a walk-up color fax.



(A0062) GST INC **$1,099**

HP DeskJet 990C

Best Photo-Quality plus Premier Business Printing • Infrared printing from PDAs, notebook computers, and other mobile devices. • Up to 17 ppm in black, 13 ppm in color • Optical sensor detects paper type, then selects the ideal print mode HP PhotoREt 3



(B1967) GST INC **$725**

HP DeskJet 930C

Compact Photo-Quality Colour InkJet Printer • Alternative 2400x1200dpi mode on photo paper with HP PhotoREt 3 • Excellent results on all types of media in all modes • Prints up to 9ppm black and 7.5ppm colour



(95761) GST INC **$257**

HP DeskJet 640c

When it's affordable versatility you need, look to the HP Deskjet 640C printer. • Print speeds up to 6 ppm in black and 3 ppm in color • Compatible with Windows 3.1x, 95, 98, NT 4.0, 2000, MS-DOS applications • Connect easily and quickly to your PC or USB-connect Mac • Add photo quality with optional cartridge



(A2288) GST INC **$170**

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See Web Direct Link (at top of page) for all your HP ink & paper needs!



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- ☐ Extend to a total of 5 Years Return to Base
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HP CDRW & Consumables

HP CD-Writer 8230e Drive



The HP CD-Writer 8230e drive is an external CD-Rewriteable drive with 4x4x 6x performance. Use the drive to create, share, and store data, photos, music, and more on high capacity CDs. Record up to 650 megabytes (MB) of data with CD-writeable (530 MB formatted) and 650 MB (up to 618 MB formatted) with CD-readable.

(A9131) GST INC **$469**

Web Direct

See Web Direct Link (at top of page) for more products and latest info!

HP CDRW 9140i & 9500i

Model	9140i	9500i
Speed	8x4x32	12x8x32
Copy & create universally readable CDs	HP MyCD	HP MyCD
CD creation using drag & drop	Adaptec Direct CD 3.01	Adaptec Direct CD 3.01
High speed CD-RW disc formatting	HP Fast Format	HP Fast Format
Full system backup	HP Simple Backup	HP Simple Backup
Mutlimedia organiser		Broderbund Multimedia Pro
Create stationery, greeting cards & more		Corel Print Office 2000
MP3 downloads	HP Music Jukebox	HP Music Jukebox
CD labelling	CD labeler	CD labeler
Included media	1xCD-R	1xCD-R, 1x high per, CD-RW
Buffering	2MB	4MB
Able to format CD-RW disc under 3 minutes	Yes	Yes
Download MP3 files & store on CD	Yes	Yes
Write & read high performance CDRWmedia	Yes	Yes
Write & read normal CD-RW media	Yes	Yes
Part #	(A8090)	(A8087)
Inc GST	**$325**	**$369**



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Toner



HP C4193A HP 4500 Magenta Toner Cartridge 6000 page
(70440) GST INC **$260**



HP C4192A HP 4500 Cyan Toner Cartridge 6000 page
(70439) GST INC **$260**



HP C4182X HP Laser-Jet 8100 Series 20,000 Page Toner
(70461) GST INC **$390**



HP C4127X HP Laser-Jet 4000 Series 10,000 Page Toner
(54731) GST INC **$266**



HP C4096A HP Laser-Jet 2100/2200 Series 5,000 Page Toner
(73192) GST INC **$213**

Paper



HP 10x15cm Premium Plus Photo Paper Glossy - 20 Sheets
(84905) GST INC **$19**



HP A4 Premium Plus Photo Paper Glossy - 20 Sheets
(84904) GST INC **$29**



HP A4 Premium Photo Paper - 15 sheets
(54010) GST INC **$19**



HP A3 Premium Photo Paper Size -20 Sheets
(58635) GST INC **$59**



HP Iron On T-shirt Transfers A4 10 pages
(52818) GST INC **$26**



HP HeavyWeight InkJet (European A4, 100 sheets)
(54009) GST INC **$29**

Ink cartridges



No 29 Black injet Cartridge
(21919) GST INC **$69**



No 78 Tri-Colour Inkjet print Cartridge
(86183) GST INC **$79**



No 20 Black print Cartridge
(A3302) GST INC **$59**



No10 Black Ink Cartridge Designjet 500
(70165) GST INC **$79**



No 45 Black injet Cartridge
(22643) GST INC **$69**



No10 Magenta Ink Cartridge
(70167) GST INC **$79**

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next generation printers

EPSON STYLUS C20UX

BONUS USB CABLE (in box) *While stocks last



The Easy-To-Use Home Colour Printer that gives photo quality printing, and delivers best-in-class for overall cost effectiveness.

KEY FEATURES
- Up to 720 x 720 dpi photo quality printing
- Fast, easy set-up and operation
- USB equipped for simple plug and play printing.
- Up to 6.5 ppm black text printing

(C5572) GST INC **$135**

EPSON STYLUS C40UX/C40SX



The Easy to use Quality Home Colour Printer with up to 1440 dpi.

KEY FEATURES
- Up to 1440 x 720 dpi photo Quality printing.
- Fast, easy set-up and operation of both models.
- Choice of USB or Parallel models, simple plug and play printing.
- 8ppm black text speed and 3.9 ppm colour text speed

EPSON STYLUS C40SX (Parallel) (C5574) GST INC **$175**

EPSON STYLUS C40UX (USB) (C5573) GST INC **$175**

EPSON AL-C2000



EPSON technologies, including AcuLaser Multiple-screen Printing, Colour RIT and Colour Stabilizing. In addition, AcuLaser Colour Halftoning provides print resolution equivalent to 2,400 dpi (defined print resolution: 600dpi). Text is extremelysharp and photoshave excellent contrast.

(A7365) GST INC **$4,430**

EPSON STYLUS COLOR 890



Economy mode: 9.6 ppm black text, 9.2 ppm colour text • 2880 x 720dpi I/FACE: Parallel and USB • 6 colours • Roll paper printing • 4pl Ultra Micro Droplets (Better tone gradations and reducing graininess) •Edge-to-edge printing (borderless printing like traditional photos)

(B3391) GST INC **$590**

EPSON STYLUS COLOR 680



With industry leading 2880 dpi print resolution and super fine 4pl Micro Droplets, images produced from this printer are indistinguishable from photographs. EPSON's exclusive Micro Piezo technology ensures high-speed throughput with crisp, sharp text.

(A8093) GST INC **$269**

EPSON STYLUS COLOR 980



One of the best business printers ever. • Up to 13.0ppm lightning fast black text printing • Up to 2880dpi photo quality printing resolution • 3 picolitre ultra micor dots for super fine printing• Network capable flexibility through type B Ethernet.

(B0594) GST INC **$695**

EPSON STYLUS COLOR 880



Here is an inkjet printer that offers everything today's business users demand – speed, super-sharp text, beautiful graphics & super smooth operation, thanks to EPSON's Micro Piezo technology. High print speed & industry leading print quality.

(B0581) GST INC **$428**

EPSON STYLUS COLOR 1160



• Printing method - On-demand inkjet (piezoelectric) • Nozzle configuration - 144 nozzles (Black), 48 x 3 nozzles (Cyan, Magenta, Yellow) • Print direction - Bi-directional with logic seeking • Resolution - 1440 x 720 dpi.

(87723) GST INC **$685**

colour scanners

EPSON EXPRESSION 1640XL



The Expression 1640XL A3+ scanner features EPSON's most advanced scanning technologies providing high speed, maximum detail and superior sharpness and clarity.

(B1330) GST INC **$5,415**

EPSON EXPRESSION 1640SU



• 1600dpi ulta high-resolution imaging • 42-bit input and output • multi-function Epson smart panel • Advanced epson twain 5 driver.

(B0556) GST INC **$558**

EPSON PERFECTION 1240U



This scanner provides 1200 x 2400dpi image quality with incredible operating ease. The EPSON SMART PANEL allows you to add high quality images to e-mail, documents & presentations, produce colour copies & photo reprints, convert scanned text to editable text & image editing tasks.

(B0546) GST INC **$422**

EPSON EPL 5800

The EPL-5800 Laser Printer is an excellent solution for small work groups, offering best-in-class features at a very attractive price:



- True 1200 dpi
- Fast 10ppm print mode
- 16MB, expandable to 256MB
- Network ready, with optional 10/100 BaseT Network Card
- Optional Adobeâ Postscriptâ 3Ô for high quality imaging and performance

(A0812) GST INC **$699**

Ask About...

- ☐ Extend to a total of 3 Years Return to Base
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- ☐ Upgrade Return to Base of Warranty Extension to On-Site



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Think in Colour

NEW PRODUCT Phaser 860

RENTSMART

SEE PAGE 64 FOR MORE DETAILS

The figures quoted are based on a per week basis over 3 years. T.A.P, Terms & Conditions apply.

Truly brilliant colour

An exceptional network-ready powerhouse A4 printer. With superior colour and **LIFETIME FREE BLACK** it's great value for money.

- High performance solid ink
- A4 colour/mono
- 16ppm colour/Mono.1000dpi max (860B, 860N)
- 16ppm colour/mono.1200dpi max (860DP, 860DX)
- First page out 10 sec colour
- RAM 64 std; 256 max
- Top 3 models Network ready
- 4 Models to choose from



FREE BLACK

have as much black ink as you need with the Purchase of Phaser 860 printer (C4255)

LIFETIME FREE BLACK

- its great value for money

RENT* $53.76 (C4255) GST Inc **$5,898**

Ask About...

- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site



Phaser 790

New Standard graphics

The ultimate graphics professional device with superior colour management tools and the ability to handle any challenge, full tabloid bleed page size and varied media.

- Laser
- A4/A3 colour/mono
- 6ppm colour
- 26ppm mono
- First page out 12sec colour
- RAM 64 std; 512 Max
- Network ready
- 2 Models to choose from

RENT* $113.42 (B2972) GST Inc

$13,845



Phaser 1235

Bridges the speed gap...

...between mono and colour printing, you receive top quality with great speed and reliability.

- Single pass LED
- A4 colour/mono
- 12 ppm colour. 1200dpi max
- 20 ppm mono. 1200dpi max
- First page out 18sec colour
- RAM 64 std; 512 max
- Network ready
- 3 Models to choose from

RENT* $66.10 (B2971) GST Inc

$7,619



Phaser 2135

Fastest all-in-one device

Never again choose between printing fast or colour — or need a separate mono printer. Now everything created can be printed in-house.

- Single pass LED
- A4 and A3 colour/mono
- 21 ppm colour. 1200dpi max
- 26 ppm mono. 1200dpi max
- First page out 18sec colour
- RAM 64 std; 512 max
- Network ready
- 4 Models to choose from

RENT* $118.99 (B8459) GST Inc

$14,525



Phaser 750

Great colour and value

Superior laser print quality, exceptional value-packed network performance, meeting all the demands for your customer's business, every day of the week in colour.

- Laser
- A4 colour/mono
- 5 ppm colour. 1200dpi max
- 16 ppm mono. 1200dpi max
- First page out 40sec colour
- RAM 64 std; 256 max
- Network ready
- 4 Models to choose from

RENT* $43.63 (A1401) GST Inc

$4,669

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Printers that mean business

PagePro 1100L

PC World Top 10 Printers September 2000 PagePro 1100L

Fast and inexpensive for small workgroups



The award winning PagePro 1100L – A4 monochrome laser is the right business solution. It's fast at 10 pages per minute, and offers a high quality 600 dpi. It's also inexpensive as a personal printer.

Print Speed	A4 10 ppm mono
Resolution	1200 x 600 dpi resolution
Interface	Parallel
Compatibility	Windows 3.1x/95/98/2000 and NT

(A1438) GST INC **$529**

PagePro 4100W

PC World Top 10 Printers January 2001 PagePro 4100W

Flexible desktop laser printing for the office



The PagePro 4100W provides the flexibility to serve todays' wide array of office environments. It combines quick 18 page per minute print speeds and superior 1200 x 600 dpi print quality output in seconds.

Print Speed	A4 18 ppm mono
Resolution	1200 x 600 dpi resolution
Interface	Parallel
Compatibility	Windows 95/98/2000 and NT 4.0

(C0310) GST INC **$1,289**

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See Web Direct Link (at top of page) for all your Minolta QMS ink and paper needs



Magicolor 2200 DeskLaser

PC Magazine Editors' Choice May 8, 2001 Magicolor 2200 DeskLaser



NETWORK READY

Affordable A4 colour for Windows workgroups. The low purchase price and operating costs of the magicolor 2200 DeskLaser make it affordable for any business requiring colour and black & white printing. Designed for compatibility with Windows 95/98/Me, NT 4.0 and Windows 2000, the magicolor 2200 DeskLaser is the perfect printing companion for Windows workgroups.

Print Speed	5 ppm colour, 20 ppm mono
Resolution	1200 x 600 dpi resolution
Interface	10BaseT/100BaseTX auto sensing Ethernet Parallel
Compatibility	Windows 95/98/2000/Me, NT 4.0

(C0669) GST INC **$2,899**

Magicolor 6100 DeskLaser

PC World Top 10 Printers May 2001 Magicolor 6100 DeskLaser



NETWORK READY

The Magicolor 6100 DeskLaser offers outstanding performance, printing up to 24 pages per minute in monochrome and up to 6 in colour. It's competitively priced to replace those black and white only printers. And when it comes to flexibility, the DeskLaser is as versatile as they get. This colour laser printer supports A4, A3 and up to 13" x 19", and even has automatic duplexing capabilities.

Print Speed A4	6 ppm colour, 24 ppm mono
Print Speed A3	3 ppm colour, 12 ppm mono
Resolution	1200 x 600 dpi resolution
Interface	10BaseT/100BaseTX auto sensing Ethernet
Compatibility	Windows 95/98/2000/Me, NT 4.0

(B1375) GST INC **$6,459**

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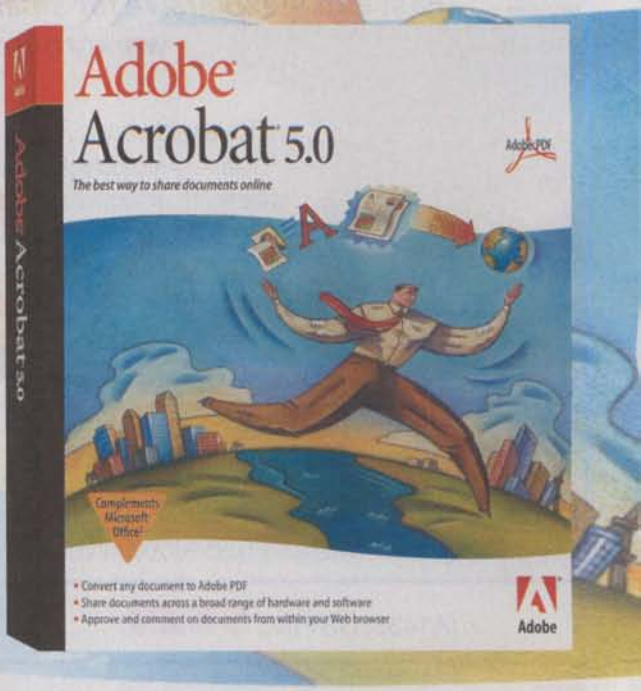
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(B9398) GST INC: **$535**

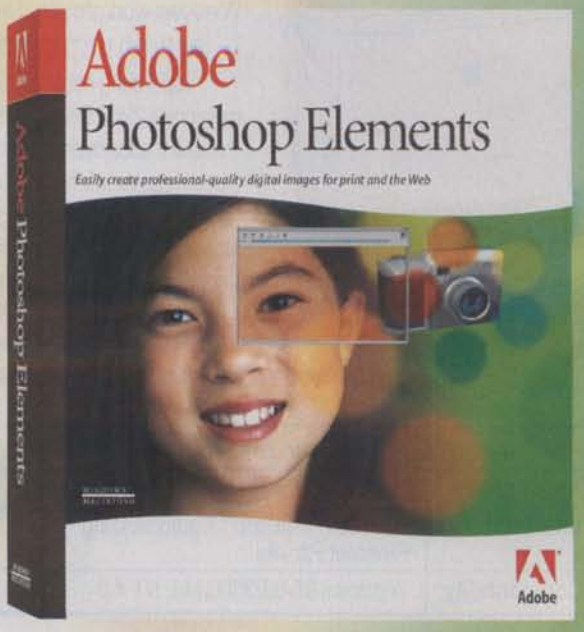
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Creating and editing digital images for print and the Web has never been easier.

Adobe® Photoshop® Elements offers unique features designed specifically for amateur photographers, hobbyists, and business users who want an easy-to-use, yet powerful digital imaging solution. State-of-the-art image-editing tools free you to explore your creativity while mastering the elements of digital imaging. Flexible image-capture options let you work with photos taken with digital or traditional cameras, and versatile delivery features enable you to prepare images for print, e-mail, or posting on the Web.



(C0676) GST INC: **$209**

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Adobe Design Collection contains the following four leading-edge design & publishing applications in one fully integrated suite: Adobe InDesign™ V1.5, Adobe Photoshop® V6.0, Adobe Illustrator® V9.0, Adobe Acrobat® V5.0 Together, these programs give you everything you need to create & produce professional images, illustrations, & layouts, and to publish documents across media.



(C2965) GST INC: **$2,289**

Adobe Publishing Collection 10

The Adobe Publishing Collection brings together four of the most powerful software programs available for creating, assembling, and delivering graphically rich designs for print and the Web: Adobe Photoshop® 6.0, Adobe Illustrator® 9.0, Adobe PageMaker® 7 Plus, and Adobe Acrobat® 5.0.



(C6124) GST INC: **$2,505**

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The Adobe Web Collection is a comprehensive, tightly integrated software suite that gives you the power to design extraordinary still and interactive Web graphics, optimize those graphics for efficient downloading, and build dynamic Web sites that support the latest technology. Includes three award-winning Adobe applications: Adobe GoLive™ 5.0, Adobe Photoshop® 6.0, and Adobe Illustrator® 9.0



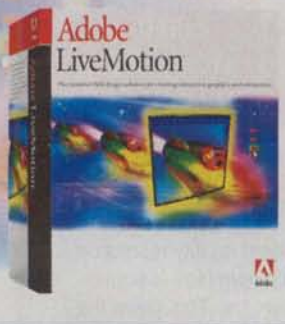
(B1152) GST INC: **$2,425**



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(A1519) GST INC: **$349**

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Adobe® GoLive™ 5.0 software gives you industrial-strength design, production, and management features so you can create professional dynamic-database-driven Web sites. Tightly integrated with other Adobe products such as Photoshop® Illustrator® and LiveMotion™ Adobe GoLive software protects your code from modification and corruption while offering industry-leading site layout and management functionality.



(99749) GST INC: **$689**



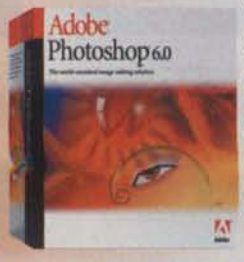
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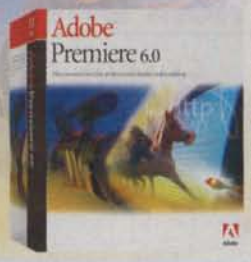


(A8347) GST INC: **$1,429**

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Adobe InDesign software is a new state-of-the-art page layout program that delivers unprecedented creative freedom, productivity, and precision while integrating seamlessly with Adobe's other leading design programs. Adobe InDesign removes the creative barriers presented by previously available publishing software, providing a powerful new set of tools that can shorten the distance between inspiration and reality.



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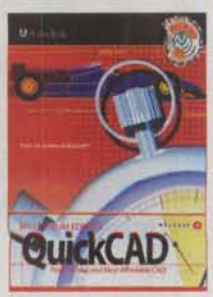
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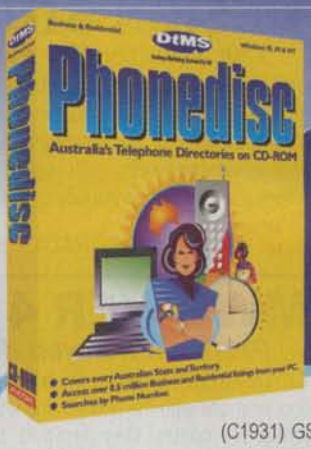
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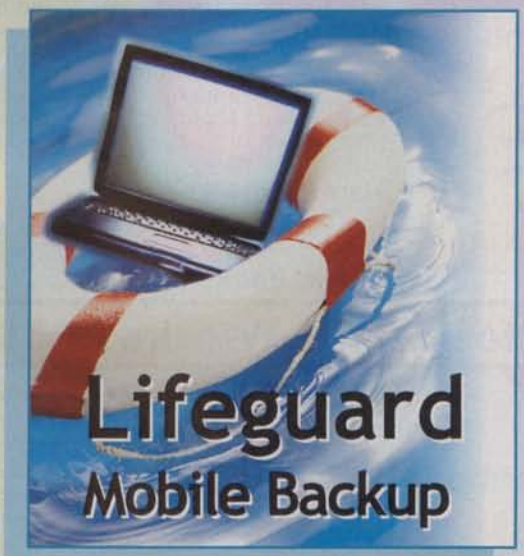
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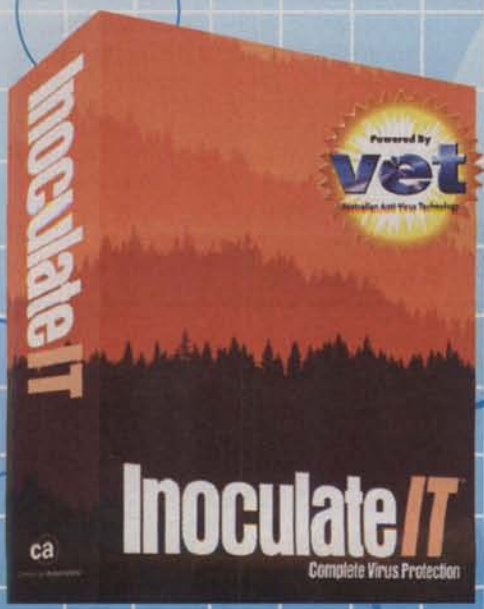


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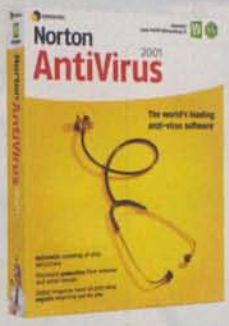


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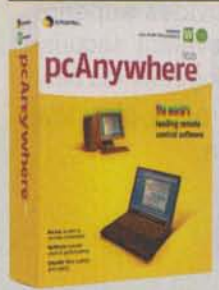
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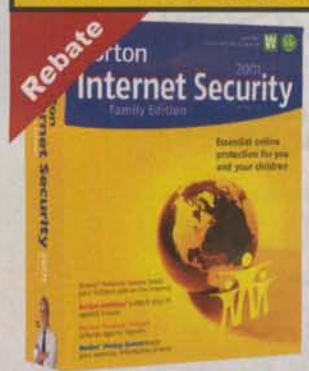
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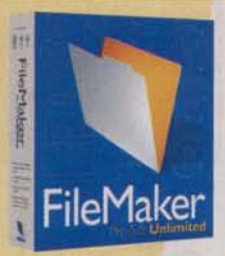
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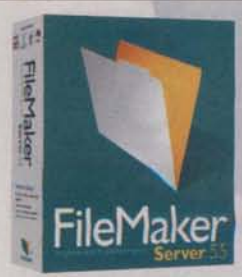
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What's hot on *APC* September CDs

Ecommerce software roundup

Setting your business up online can be costly if you hire a Web development company. Enter do-it-yourself ecommerce software! This ecommerce software roundup ensures that anyone, even those with no previous programming or Internet experience, can build a professional-looking Web site, complete with a glossy product catalogue and shopping cart to take orders. Unbelievably easy!

Free complete versions

This month, *APC* has full working versions of three fantastic ecommerce programs to give away, as well as a host of special offers.

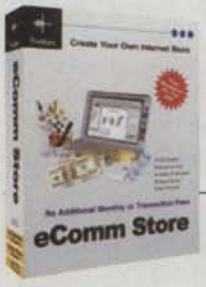


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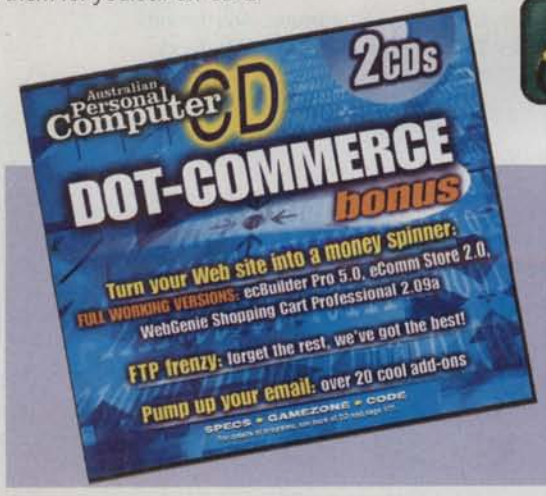
GameZone

To coincide with our best ever sci-fi flight sims special, this month's GameZone features demos of some awesome space sims. Also included are some of the latest and most anticipated demos, straight from the Web, including Alone in the Dark 4: The New Nightmare, Anachronox, MechCommander 2, Operation Flashpoint and Startopia.

FTP face-off

Read *APC*'s reviews of the latest FTP clients (page 102), then try them for yourself on CD 2.





Email additions

Also this month, *APC* has the latest and coolest email client add-ons to spice up your emails and help you get organised. From backup utilities to security providers, email readers to HTML tools, we've got a little bit of everything. And all our regulars are here: Toolkit, the latest browsers and a selection of shareware reviewed by our OS specialists.

Your guide to the cover CDs

The *APC* cover CDs complement the magazine and **apcmag.com**. Each month's disc collection features software related to articles in that issue, as well as special CD-only features and Web browsers.

Each piece of software includes instructions on whether you need to unzip the file before installing it, and most also include README files.

The CDs were created in HTML. You do not need any special software to access them, other than a standard browser.

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APC September CD contents

CD 1



Workshop

Windows: AutoSpell 5.46, Awave Studio 7.3, The Bat 1.52, Button Studio 1.44, CSE HTML Validator Professional 4.52, E-Mail Express 1.3, ezBooks 1.2 FaxTalk Messenger Pro 6.0, NetworkView 1.3, PhonePad 2.12, Serv-U 3.0, StuffIt Expander 6.0, Ultimate ZIP Cracker 6.5, WriteExpress Easy Letters 2001

Linux: Broadcast 2000c, Firestarter 0.7, Gabber 0.83, Gnome Toaster 20010424, GTetrinet 0.41, IRCd 2.10, Jabber Server 1.41, Marbles 20010307, Opera 5.0, Partition Image 0.3.6, SafeDelete 1.3, Wing IDE 1.0, Xdialog 2.0, XMMS SMPEG 0.3.4, Zapping 0.5.92

PDAs: 3D Blockout, Ababall, The Beast from Uranus, Classic Arcade Games, G-Pod, G-Prime, ICBM, Isoworld, Knockdown Karate, Oliver's Action Pack, Palm Runner, Palm Scud Attack, Racing Days, Reckless Thief, Tank Pilot, V-Rally

Mac: AutoCat 3.0.1, FontExampler 1.0pr3, Goldberg 2.1.3, Iconata 1.0.5, iView MediaPro 1.0.5, Mactracker 1.0, MP3 Rage 3.3, NotePad Deluxe 2.2, PhotoStickies 1.0.1, QuickDiaryX 3.0

OS/2: AnPoCODEC 6.0, AssoEDIT 1.6, IDE Zip Driver, Toyland 1.0

First Take

Notebook specifications, Intel Pentium specifications

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Patch Panel

Mandrake 8.0 updates, Red Hat Linux 7.1 updates

Browsers

Microsoft Internet Explorer (32-bit) 5.5, Microsoft Internet Explorer 5, Netscape 6.01

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Email client add-ons: e-Backup 1.0, Email Announcer 2.1.0, EmailPlugin 1.0, Eudora Archiver 1.2, Express Archiver 1.0, Express Mail@Mate 2.2.2, Genie Reader 1.0.0, Glance for Outlook 2000 2.0, LBE Toolbox for Microsoft Outlook 1.0, MailNavigator 1.0, OSK (Outlook Survival Kit) 1.7.5, Outlook Express 5.02, Outlook Express Archive Pro 4.0, Outlook Express Email Address Extractor 2.0, Outlook Express Menu 1.1, OutTray 1.1, PGP Freeware 7.0.3, QuantaMail 1.1.5, ScanMail for Microsoft Outlook 1.1, SmartWrap 1.8, VCatch Virus Catcher 3.5.2.8, Watch Your Back 4.20

Ecommerce: Business in a Box 2.1.1, ecBuilder Pro 5.0 , eComm PRO 2.0, eComm Store 2.0, ezimerchant Professional 3, iNETstore Studio 2001, WebGenie Shopping Cart Professional 3.75

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GameZone

Alone In The Dark 4: The New Nightmare, Anachronox, MechCommander 2, Operation Flashpoint, Startopia

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Return to the world of Dune — this time in 3D.

Dune revisited

Emperor: Battle for Dune

Two-dimensional real time strategy (RTS) games reached their peak in 1997 with Blizzard's excellent StarCraft. It seamlessly melds an excellent storyline with very polished gameplay, and although the graphics aren't stunning, they were considered quite good when the game was released. Not many big changes have occurred in the RTS arena since then. There have been a few outstanding titles (such as the 3D space-based Homeworld), but RTS games have tended to conform to a standard pattern. Westwood, which virtually pioneered the genre with Dune II: The Building of a Dynasty in 1992, was particularly guilty of this, and the company has been accused of merely churning out Command & Conquer clones since 1996.



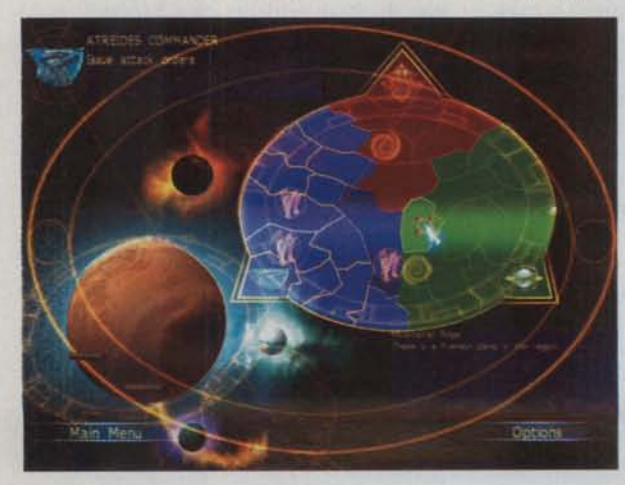
Emperor is the company's first step into the 3D RTS scene, and it tips its hat to Dune II. Given the success of the Command & Conquer series, there's no doubt that Emperor will sell extraordinarily well, but is there much to distinguish it from its 2D brethren?



The game starts off like most other Westwood RTSes: a flashy cut scene populated by classy actors (often not doing their best to inhabit their roles) introduces you to the Dune universe and the three main factions. The story is developed to follow that of the original novels, and the planet Arrakis has been effectively returned to a disputed world.

Three houses, the Atreides, the Harkonnen and the Ordos, must duke it out for control of Arrakis, the only known source for the Spice — the substance that makes intergalactic travel possible. It's an old sci-fi adage: whoever controls Arrakis controls the Spice, and whoever controls the Spice controls the universe.

In terms of missions, Emperor serves up a five-star buffet. The single-player game boasts over 150 levels — around 50 for each house. Arrakis consists of 33 territories, and to become the winning house you must take control of them all. The territorial strategy element is turn-based. Each house takes turns in selecting a territory to conquer, and a disgruntled opponent can often force you to return to the scene of a previous mission to defend the turf. The action on Arrakis is interspersed with standalone missions, both standard and squad-based (where you have to make do with a few troops and reach a specific goal). These often do not even take place on Arrakis, moving to places such as the bowels of a starship or on the home world of one of the three houses. Missions on Arrakis have the added excitement of sandworms, which can unexpectedly appear and devour troops and vehicles as they move across the desert.



The game's artificial intelligence (AI) is usually quite good, although it's not without its flaws. Your enemies put up a valiant fight, and will frequently wait to amass a large force before sending it to destroy your home base. On the other hand, they can also send wave after wave of soldiers against your anti-personnel turrets, despite the fact that they are repeatedly cut to shreds.



The units are the standard fare: half a dozen different types of troops, scout vehicles, aerial vehicles and heavy, slow-moving tanks. There are one or two interesting new types, such as the Tleilaxu, (which can infest enemy units with their own alien seed, resulting in the death of the unit and the birth of a new Tleilaxu) or the Fremen Fedaykin (which can summon and ride sandworms).

Where Emperor really shines is in game mechanics. Commands have been finetuned and tweaked, and the overall feel is of a highly refined game. It has a few flaws, but Emperor is still a pleasure to play.



Westwood has created an exceptionally polished RTS. While it doesn't do much to set itself aside from the company's previous titles, Emperor streamlines the gameplay model even further — the action is fast and full-on. *APC* didn't think it was possible to milk even more fun out of the Command & Conquer game model, but (once again) Westwood has proven us wrong.

Daniel Gardiner

Contact Electronic Arts
Phone (02) 9955 7744
Online westwood.ea.com
Price $87.95
Requires Pentium II 266, Windows 95, Windows 2000, 48M RAM
Classification M(15+)
Rating ■■■■■■■■■■

Kohan: Immortal Sovereigns

Earlier this year, Timegate Studios released its premiere title, Kohan: Immortal Sovereigns, in the US, with little fanfare and a sparse advertising campaign. Almost immediately, the game attracted praise from the critics, and its fan base has grown steadily ever since. This surprise success was not unwarranted; Kohan successfully transfers the complex planning involved in a turn-based strategy game into a detailed real time environment.



Kohan won't be winning any awards for its storyline. You play Darius Javidan, a member of an ancient race of immortals called Kohan who revert back to amulets (yes, you heard right: amulets) once their mortal frame is destroyed. Darius awakens from his amulet to find the generic fantasy world of Khaldun under siege from a stereotypically evil force. Thus begins the main single player campaign. The story doesn't improve much and the 16 missions are all strictly linear, so the campaign is decidedly mediocre. It remains interesting, because the gameplay is refreshingly creative.



The gameplay dynamic is reminiscent of the Civilization series: the main structure is the city, within which various sub-structures are built. The economy is not managed by peons who stockpile resources, but by the construction of buildings that add to global income rates. Every unit that is created incurs a constant resource toll, rather than a one-off fee, which means that most early game rushes are cost prohibitive.

Combat units are created and controlled in companies composed of six members: four frontline troops as well as two support troops. Units within a specific company cannot be managed individually; they must be moved at the company level. Companies can move in four different formations, which can change their combat speed and effectiveness. The fastest moving formation has the units running in a single column, but this reduces their combat efficiency. Other factors — such as morale, terrain and experience — may also modify company performance. Once they are engaged, a company cannot be controlled, short of a full retreat. This makes troop management an integral part of the game. Winning in Kohan lies in careful planning before the battle, both in the selection of units and their deployment.

Most of the maps also have independent structures guarded by monsters, which will give you various goodies once the guardians are dispatched, such as gold and technology. Some of the discovered technologies just apply a passive bonus to your troops, while others allow an entirely new type of unit to be commissioned. You may also find individual Kohan in amulet form, which you can then awaken and assign to lead companies. Kohan also gain experience with the company, increasing their effectiveness. There are independent cities as well, which remain neutral unless attacked. These cities provide unique and powerful units once conquered.



All of this is perfectly suited to the game's excellent customisable random map generator. It is here that the game truly shines, demonstrating a sharp eye for tactical detail and a streak of randomness that helps break the 'canned strategy' trap into which most real time strategy games fall. Gaining a certain technology from a monster's lair could shift your entire game strategy in a different direction.

Kohan does leave a lot of areas open for improvement: the graphics are adequate, but locked at 1,024 by 768 resolution; the voice-overs are consistently delivered in a monotone; the story is tepid and unoriginal; and the campaign is somewhat short and linear. Still, a fantastic random map mode, a great custom editor and phenomenal gameplay easily outweigh all of these relatively minor quibbles.

Kohan expertly borrows concepts from many of the strategy giants and blends them with its own innovation to create one of the most compelling strategy titles in years. If you are at all interested in real time strategy games, you owe it to yourself to try it out.

Daniel Warner

Contact Unknown at time of printing
Phone Unknown at time of printing
Online www.kohan.net
Price $89.95
Requires Pentium II 266, Windows 95, Windows 2000, 48M RAM
Classification G(8+)
Rating ▮▮▮▮▮▮▮▮▮▮

Z: Steel Soldiers

After a protracted four-year development, the original Z, released in 1996, was a big disappointment. It was fun and easy to get into, but the graphics were already dated at the time and the game didn't offer the depth that its rivals (Warcraft II and Command & Conquer) managed. The most surprising thing about this sequel is how little has changed. The real time strategy genre has barely progressed at all in the past five years, and most of the strengths and weaknesses of the original Z are still present in Steel Soldiers.

The story is revealed by a none-too-serious opening cartoon. After 500 years of conflict between MegaCom and Trans-Global, a historic peace agreement has been signed. On the eve of the ceasefire, due to begin at midnight, two of Captain Zod's MegaCom robotic soldiers find themselves in trouble after investigating unidentified personnel on the border. For the first of the 30 single-player missions, you must find and save your hapless soldiers.



Gameplay follows a typical real time strategy formula, balancing developing a base, building units and attacking the opposition. As in the original Z, you don't harvest resources; instead, you gain credits to use for building according to how much of the map you control. Moving into new territories, defeating rivals and claiming flags widens the area under your control. Extra credits allow your factories to produce more construction robots, combat units and structures such as artillery emplacements and teleporters for dispatching troops around the map quickly.

The territorial system should encourage you to explore and try to gain land quickly, but the best strategy in almost every mission is to amass a huge army as quickly as possible. You might need to have some minor skirmishes to grab nearby territory and ensure your production is as rapid as possible, but most of the time, you'll be supervising factory production while waiting for the huge and hectic showdown. The very sharp artificial intelligence and lightning-fast rate at which the enemy can make new troops only exacerbate the problem.



There are ground, air and sea units to build, including some very clever troops, such as spies who can infect enemy computers with viruses, snipers who can kill enemies from long range and explosives experts. Your robot forces aren't stupid; your warriors will engage the enemy if they are in their line of sight and defend the base if under fire, while any nearby construction bots will start to repair it.

Grouping units to venture out and fight can cause problems, as some units tend to spot enemies before others and go out alone and vulnerable. The game also really needs to have more keyboard shortcuts to help you in the heat of battle.



While the game's hit-and-miss humour manages to give it some personality, the graphics don't impress. Environments include desert, jungle, ice and volcanic areas and while there are some pleasing touches, such as big explosions, grazing wildlife and reflecting lakes, there's nothing too memorable. However, a big thumbs up must go to the information panels, which are opaque and can be moved around the screen to ensure that you can see as much of the map as possible while still being presented with crucial information about your forces.

Steel Soldiers is a fun title in both single and multiplayer modes, but it's far from inspiring. Its territorial system ensures a fast pace, but it looks and plays like most other real time strategy games.



If you wish, you can choose to play the game more creatively, waging constant battles to grab a foothold across the map, but ultimately, it's hard to avoid simply cranking out troops before each level's Armageddon.

Jason Hill

Contact OziSoft
Phone (02) 8303 6800
Online www.zsteelsoldiers.com
Price $89.95
Requires Pentium II 266, Windows 95, 64M RAM
Classification G(8+)
Rating ▮▮▮▮▮▮▮▮▮▮

Startopia

Startopia doesn't provide instant thrills, but it's the kind of game that doesn't let go once it has a hold of you. Your mission is to rebuild and maintain derelict space stations, thereby creating a utopia for nine alien species — and making a big wad of cash along the way. Throughout the 10 missions, you need to build basic facilities, hire alien staff, make cash and use your funds to expand your empire.

The early missions are really just very detailed and complex training runs, and serve as appetisers for the brilliant but demanding Multiplayer and Sandbox modes. Sandbox is an apt name for the latter — Startopia provides players with a giant toy box full of surprises, possibilities and miniature aliens filled with life and personality.

Startopia's creator, developer Mucky Foot, certainly knows a thing or two about making great management games. The company's founders were all ex-employees of Bullfrog, the producer of gems such as Theme Park, Theme Hospital and Dungeon Keeper. The same beautifully balanced design found in those three titles is evident in Startopia, as well as the same wonderfully quirky sense of humour. The hilarious introduction, inspired by *2001: A Space Odyssey*, is just the beginning of the giggles you'll enjoy while playing.

The game's excellent training missions allow you to get the hang of controls and basic skills quickly and easily. They teach you how to unpack crates that contain blueprints for buildings, new technologies and droids. You'll also learn how to hire employees, manipulate the biodeck landscape and command your troops in battle.



The missions that follow provide finite scenarios. Each tends to concentrate on a particular skill possessed by one of the alien races or a particular tactic you'll need to employ in the lengthier contests. The aliens specialise in different areas such as medicine, recycling, gardening and security, and you must employ skilled workers in particular industries to build and maintain your community. You also need to keep everyone happy with recreational buildings like discos, shops, bars and 'love nests'. A sarcastic, oh-so-droll computer is your helpful assistant to guide you through the missions — he never misses a chance to alert you to a problem and throw a quick gag or two in for good measure.



The standard of presentation throughout the game is extraordinary — just watching the aliens go about their business is fascinating. The space station is split into three decks and has 16 radial segments — players begin with just three to develop. You will require plenty of energy to open additional segments, so you have to be careful not to expand too quickly and spread your resources too thin. However, if you play too conservatively, you risk losing territory to your opponents, who may then become strong adversaries. The game is a constant juggling act between risk and reward, and you have to continually think ahead and try to second-guess your opponents.

Not only do you have to expand rapidly, but you also have to worry about protecting your space station against enemy spies, assassins and saboteurs. When you do eventually make contact with a hostile force, combat is controlled like a mini real-time strategy game. You can assign muster points and increase or decrease the importance of specific targets.

Sure, this game can't be described as innovative, but it is a long way from SimCity in space. It is packed with clever ideas, has been astutely playtested, and delivers a perfectly balanced game. The detail is amazing and the variety of buildings, technologies and races ensures a wide range of options and strategies. Fans of management games are in for a rare treat.

Jason Hill



Contact OziSoft
Phone (02) 8303 6800
Online www.startopiagame.com
Price $89.95
Requires Pentium II 350, Windows 98, 64M RAM
Classification G(8+)
Rating ▮▮▮▮▮▮▮▮▮▯

Operation Flashpoint

The PC first-person shooter (FPS) market is big business at the moment. Every month, a new title claims that it has surpassed all predecessors. Luckily, FPSes are divided into sub-genres that give gamers some idea of the range of titles out there.

Operation Flashpoint is primarily a strategy-based shooter. You use all of your resources and teammates to work towards a common goal in a loosely-based FPS environment. The very popular Rainbow Six titles provide the standard for all strategy-based shooters, and are an excellent example of the genre. So how does Operation Flashpoint fare against such formidable competition?

Operation Flashpoint is set in 1985, in the declining years of the cold war. The story revolves around a fictional conflict between NATO and rebel Warsaw pact forces located on the Malden Islands. Will World War III break out? Not if you and your team have anything to do with it. You take on the role of a lowly private, David Armstrong. At first you simply obey orders, but as the missions progress, you move up through the ranks and increase your expertise in the field. Some missions require you to pilot different types of vehicles, including helicopters, jet fighters, jeeps, trucks and tanks.

This is a frighteningly realistic battlefield game, and there is good reason for its accuracy. Operation Flashpoint's maker, Bohemia Interactive, is a small team based in Prague that consists entirely of veterans of the Czech Army — these developers have experienced war first hand.

The game can be played as individual missions or in campaign mode, and has *great multiplayer support* through LAN or Internet. It also contains a built-in full-featured level editor. The individual missions are pretty standard — you develop your warfare skills and hone your tactics during one-off combat missions. The campaign mode is a little different. You warm up with a few training exercises and then it's into battle for real. The training exercises give you a great chance to familiarise yourself with the controls of the game.

The problem with most games like this is that they get caught up in realism, and in the process the developer's vision of how the game should play is obscured. Thankfully, Bohemia Interactive has managed to avoid this. The keyboard controls have been kept simple. Everything is stripped back to a bare (yet functional) minimum — you can tell that the developers spent a lot of time playtesting the control options.









Overall, Operation Flashpoint is a highly polished piece of work. It has received a lot of hype since the release of the demo, and surprisingly, the final version managed to live up to our high expectations. It works well on so many levels, from the huge nonlinear landscapes in every mission to the sheer volume of weapons, artillery and vehicles that can be used to defeat your enemy. Be warned, however, the game is pretty power hungry. Apart from that, the sense of immersion in this title is fantastic, and the scope of the strategy involved is unparalleled.

Ryan Shaw

Contact OziSoft
Phone (02) 8303 6800
Online www.codemasters.com/flashpoint
Price $89.95
Requires Pentium II 400, Windows 95 or Windows 2000, 64M RAM
Classification MA(15+)
Rating ■■■■■■■■■■

Star Trek Voyager: Elite Force Expansion Pack

Star Trek Voyager: Elite Force was a surprise hit, not so much for its level design or gameplay, but because it was the first decent and enjoyable Star Trek game — as far as *APC* could recall. Set on the *Voyager*, deep within the Delta quadrant, far from Starfleet, Elite Force is based on the creation of the Hazard Team: a frontline security force responsible for handling crises as they arise. You play Ensign Munro, a wet-behind-the-ears team member who rises to prominence as the game unfolds.



Elite Force is a first person shooter with the look, feel and execution of a classic Voyager television episode. The game is great, and has been crying out for an expansion pack — just not this one. The pack promises a lot, but what it delivers is patchy. If you love playing multiplayer games on Elite Force, you are rewarded with many new levels and games, but if you like single-player action then look out, because that aspect is incredibly thin: a mere four levels to play on the Holodeck, none of which is very good.

There are only two parts of the pack that really reward the trekkie: you can explore 10 levels of the *Voyager* (there's a treasure hunt across the ship for Voyager action figures and Neelix's recipes), and a voice pack replaces the voice used for Seven of Nine in the original game with that of Jeri Ryan who plays the character in the TV series (this pack is available online for free in any case). It would be great to see a second expansion with a dedicated single-player campaign and continuation of the storyline. All in all, this expansion pack is not really worth the money.



Darren Ellis

Contact Activision
Phone (02) 9869 0955
Online www.ravensoft.com/eliteforce
Price $32.95
Requires Elite Force, Pentium II 233, Windows 95, Windows NT4.0 with Service Pack 5, Windows 2000, 64M RAM
Classification MA(15+)
Rating ▮▮▮▮▮▯▯▯▯▯

Leadfoot: Stadium Off-Road Racing

Stadium off-road racing has become something of an institution in the southern states of the US. Enormous stadiums, high-speed 4x4s, huge jumps and plenty of carnage, mean excitement is guaranteed. Australian developer Ratbag has based its newest driving simulation on this experience — and Billy Bob, Buck and all the boys can rest assured that this game is just dandy.

Leadfoot's racing is based on short dirt circuits that feature frequent jumps and numerous hairpin corners. The very nature of dirt track racing initially makes the game quite difficult, although the inclusion of multiple skill options should allow most gamers to start racing straight away.



As you'd expect from an off-road simulation, the racing in Leadfoot is fast paced and exciting. Collisions are commonplace, and competent artificial intelligence means that most races are tightly contested. The cars handle superbly, and the physics engine offers a perfect balance of outrageous airs and well-controlled power slides.

The cars range from tiny dune buggies to huge, high-powered 4x4s, and vastly different driving techniques are required in order to successfully manoeuvre each model through the circuit. A fairly comprehensive tuning facility has also been incorporated, where experienced racers can tinker with everything from suspension settings to wheel camber.

The game's incredibly sharp graphics complete the package. Support for resolutions of over 1,600 by 1,200 and highly detailed surfaces mean that tearing around Leadfoot's magnificently rendered 3D stadiums is truly a sight to behold. As with all Ratbag games, such high-quality graphics are maintained at great frame rates, so a proper sensation of speed is maintained at all times.



Leadfoot is one of the most enjoyable racing simulations to be released in recent times. So fill up the pick-up and strap in, son, 'cause we're going racing! A-yeeeeehaaaa!

Alan Crawford

Contact Take2 Interactive
Phone (02) 9482 3455
Online www.ratbag.com.au
Price $49.95
Requires Pentium II 266, Windows 95, 32M RAM
Classification G
Rating ▮▮▮▮▮▮▮▮▯▯

Gangsters 2



The original Gangsters was a great idea but badly executed. You play a small-time hood who, through graft, extortion and lots of murder, works his way to the top of the gangster food chain. Along the way you acquire businesses (legitimate or otherwise) to bankroll your operations, as well as muscle to help with the dirty work. Unfortunately, poor unit AI and a badly designed interface make the missions difficult and confusing. The game sank like a concrete shoe. Nevertheless, Hothouse Creations has stepped up for another shot, but has it managed to get the formula right this time?

You play Joey Bane, whose father has been murdered by the mob, and you're out for vengeance. The first few missions introduce you to the game's mechanics — recruiting goons, performing hits, running businesses and taking over territory. You soon learn that there are dark forces behind your father's death, and as the story unfolds, you are dragged deep into the gangster underworld. In pursuit of revenge, you must build a bigger and bigger empire until, by the end of the game, you are kingpin of an entire state.



Gameplay is a straightforward blend of economic management and tactical combat. Information screens are used to manage your businesses and organise your hoodlums. The action takes place in a 3D isometric view window that occupies most of the screen. Overlay maps show you the location of key buildings as well as the areas of the city that are under your thumb.

Like all aspiring godfathers, you have a consiglieri (advisor) who pops up from time to time with useful suggestions and information, as well as a twice-daily newspaper featuring stories that tell you what's been going down, the names of the police's most wanted (usually your guys) and a list of hoods available for hire.

Your accomplices have a variety of specialised skills that can be employed. At the end of each successful mission, you receive a number of experience points that you distribute amongst your team to improve their skills. Frustratingly, you can never take more than three accomplices into the next mission, which means your newly recruited henchmen are often weaker than those you have left behind.

The game runs in real time and there is often a time limit for achieving the mission objectives. The information provided by your advisor and the newspaper, along with a reasonable tutorial and manual, gives you greater control over the missions than in the original game. The unit AI is also better, although most combat still boils down to man-to-man shoot-outs. The economic model is more simple than in the original, but although this makes the sequel easier to handle, a feeling of boredom and repetition inevitably creeps in.

The graphics are serviceable but dated. The streetscapes are rather mundane and the characters could have been rendered with more detail. This is a shame, because the 1920s gangster era is potentially rich in atmosphere and the developers could really have gone to town. In fact, this is symptomatic of the game overall: while it is enjoyable enough to play, you can't help feeling that the creator's great idea has still not been fully exploited.

Jon Gill

Contact OziSoft
Phone (02) 8303 6800
Online www.gangsters2.com
Price $89.95
Requires Pentium II 266, Windows 95B, 64M RAM
Classification M(15+)
Rating

Gamespy

- The troubled Dallas wing of games developer Ion Storm has suffered a blow with the loss of its two founders — Tom Hall and John Romero. Romero, the veteran game designer who helped create Doom and Quake, had previously failed to meet publisher Eidos' expectations. Hall's departure is a surprise, especially so soon after the release of the Anachronox, a title he had a significant hand in developing.

Ion Storm Dallas' most notable failure was Daikatana, Romero's first game release since leaving Quake developers id Software. The game was delayed numerous times and critically panned upon its release in mid-2000. It also failed to sell anywhere near the number of copies Eidos had hoped for. At the time of writing, there was no official word on Romero's plans for the future.

Ion has a second development studio, located in Austin and headed by Warren Spector. It most recently produced the hit PC title Deus Ex.

- In other Ion Storm-related news, work continues on Thief 3 and Deus Ex 2. First looks at the two games have recently appeared on the Web, and although both are in the early stages of development, they look promising. At this stage, they both seem to be using modified versions of the Unreal engine, which may disappoint some fans, who lamented the performance issues that plagued the original Deus Ex. Thief 3 seems to have made the transition from Looking Glass Studios (developer of the previous two Thief games) quite well, as the accompanying images can testify.





Best ever sci-fi flight sims

For as long as they have been around, science fiction flight simulations have been incredibly popular. There's something extremely appealing about jumping into the cockpit of a starship or highly modified plane and dogfighting in the heavens. This month, APC *looks back at some of the best releases.*

Crimson Skies (2000)



Set in a mythical 1930s world, Crimson Skies places you smack bang in the middle of a war between hostile US states. Flight has become the main mode of transport, and you play a sort of flight-enabled version of Robin Hood — air pirate Nathan Zachary. This title deliberately focuses on fun battles, so it's not as heavy on simulation as it is on action. The graphics are quite good, and the sci-fi angle on the 1930s planes is pulled off very nicely.

Colony Wars (1997)



This little beauty amazed gamers when it was released, as it brought excellent space combat to the PlayStation. More than just an arcade shooter, Colony Wars includes cool X-Wing-style dogfighting. Its two sequels are also of a high standard — especially Red Sun, which allows you to customise and upgrade your ship in a similar fashion to Privateer. The games use an interesting physics engine which gives your craft mass and inertia and simulates a more realistic space environment.

Starlancer (2000)



Developed by Digital Anvil — a company founded by the man responsible for the Wing Commander games, Chris Roberts — Starlancer is the unofficial successor to Wing Commander. Admittedly, Starlancer rates second to FreeSpace 2, but it is still a great game in its own right. The balance it provides between conventional PC space combat and arcade action is especially noteworthy. It also incorporates a fantastic co-op multiplayer element, which allows up to four people to play together through a single-player campaign.

Independence War (1997)



I-War is one of the most distinctive space sims around — instead of piloting a small fighter, you take charge of a huge 'corvette-class' battleship. No other game simulates the task of commanding a large starship so convincingly. Your ship, the Dreadnought, has different sections, such as command, weapons, engineering and navigation, which must be maintained. The story is compelling, and helps motivate players to tackle the steep learning curve. The sequel, Edge of Chaos, is scheduled for release by October.

Star Wars: X-Wing (1992)



The first title in LucasArts' line of Star Wars flight sims, X-Wing dazzled PC gamers. Every geek's dream of flying in the Rebel Alliance came true — in glorious low-polygon 3D. X-Wing was released before 3D cards became popular, so the ships are blocky and low on detail, but the game succeeds where it counts, cleverly weaving together storyline and gameplay. X-Wing was an instant classic. X-Wing Alliance (1999) is the final part of the series, and comes very highly recommended.

Privateer (1993)



A spin-off from the Wing Commander series, this game fits somewhere between those titles and harder simulations such as Elite. You play a civilian pilot who makes his fortune by flying dangerous missions. Standard combat missions are interwoven with plot-oriented ones. The main difference from Wing Commander is that in Privateer you must purchase all your ship's requirements, so missiles, shields, guns and other components are upgradable. There are also four types of ship to choose from.

Descent: Freespace 2 (1999)



Descent: Freespace is a great space sim, but it was the sequel that really showed the competitors how it's done. Freespace 2 is rather light on plot and character development, but it more than makes up for this in gameplay, visuals and sound. The amazing graphics are highlighted by the unique environments the game provides. The gaseous nebulae are truly a sight to behold — flying through great clouds of red mist creates an incredible atmosphere, especially when you are accompanied by devilish flashes of lightning and booming thunder. Freespace 2 also does a great job of putting you right at the centre of battles between 'capital class' ships. Giant laser beams lash out into space and rip holes in huge ships, while small fighters buzz around them, duking it out.

Elite series (1987 onward)



Elite was the first, and possibly the greatest, space-trading game. Made back in the late 1980s, Elite uses line-art models to represent 3D ships, space stations and planets. The graphics were considered good for their time, but where Elite really shines is in its open-ended gameplay design. The objective of the game is to get rich trading goods between space stations, and part of the fun lies in exploring the small corner of the universe where the game is set. Larger profit margins can be gained by trading with the outlaw systems, which are usually inhabited by pirates. You can also customise and upgrade your ship, smuggle contraband and, of course, engage in combat with other ships. Two successful sequels have been released, and a fourth title is currently in the works.

Tie Fighter (1994)



X-Wing introduced PC gamers to realistic space combat in the Star Wars universe, and Tie Fighter's polished X-Wing models, upgraded graphics and great new gameplay elements did a lot to further the series' reputation.

In this game, you join the Dark Side and follow the Emperor in his quest to crush the Rebellion. A great background story drives excellent missions, and secret mission objectives add an element of intrigue. Achieving these covert goals allows you to climb the ranks of the Emperor's secret society . . . and earn cool tattoos to boot! Tie Fighter is regularly named one of the best PC games of all time in PC gaming publications.

Wing Commander series (1990 onward)



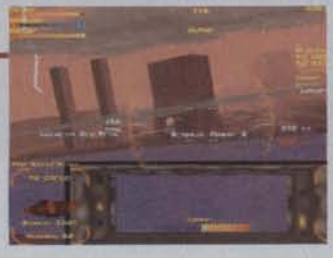
Origin's flagship space combat series puts players in the role of Christopher Blair, a no-holds-barred space ace whose mission is to battle the evil Kilrathi, a race of lion-humanoid hybrids. Before the movie brought shame to the Wing Commander name, Origin virtually pioneered the space combat game with the first two instalments of the series. Mark Hamill joined up for the third part, although many long-time fans were disappointed with its emphasis on full motion video, which seemed to come at the expense of gameplay. The series regained some of its former glory with Wing Commander: Prophecy, which, while retaining the video focus, also offered improved gameplay.

Would make Luke Skywalker proud

Hardwar

Tachyon: The Fringe

X: Beyond the Frontier



Allegiance

Star Trek: Klingon Academy



As shameful as Jar Jar

Independence Day



Battlecruiser 3000 A.D. (1.0)

Star Wars: Battle for Naboo



Wing Commander: Armada

X-Com Interceptor

Unravel the conundrum of consciousness, thread your way through a thriller and elucidate the enigma of XML.

Multiple mysteries

A Mind So Rare

This is a scholarly work, and consequently, it calls for study rather than browsing, and even though some of the specialist terminology is defined, you may need a dictionary handy. Author Merlin Donald isn't joking when he says "Intelligent reading is a highly aggressive, active business".

Donald's main thesis is that culture is an important contributor to consciousness, as it provides an external store of knowledge that mirrors our own memory. Our long-term memory is reflected by the permanent storage provided by books, pictures and similar artefacts, while the analogue of our short-term working memory is the page or computer screen in front of us. He argues that since literacy and short-term memory are handled by different parts of the brain, the result is a richer structure, while the relative permanence of external storage allows a "scaffolded" process of accumulation and improvement. This is highly compatible with our experience of accelerating change as IT develops.



Programmers will recognise the metaphors presented: the ability to read, once we have it, is available regardless of context, and this is comparable with a subroutine that reverses a list of items regardless of their type. Both of these represent mental modules that, once developed, can undertake a process without the need for conscious attention and can be reused in different circumstances.

The insights of this book are so good, they seem almost self-evident.

Stephen Withers

Author Merlin Donald
Publisher WW Norton
Contact John Wiley & Sons Australia
Phone 1800 777 474
Price $59.95
ISBN 0393049507
Rating ■■■■■■■■□□

Tell No One



What do you do when you receive an email from your wife, who was murdered on your anniversary eight years ago? When the hotlink given in the email takes you to a Web cam showing video of your wife alive and well? Is someone exploiting the anonymity of the Internet to play games with you? If she really is alive, what actually happened eight years ago and why has she waited until now to reappear?

These are the questions facing Dr David Beck, the central character in *Tell No One*. Shadowing Beck as he follows his wife's trail are sinister forces who want the truth to remain buried, as well as the FBI and police who suspect Beck in the original crime. Throw in an eclectic supporting cast, including a helpful crack cocaine dealer and a lesbian supermodel, and you have all the ingredients for a richly entertaining suspense thriller.

The story swings between first-person narratives by Beck and third-person descriptions of events occurring behind Beck's back. This gives a good perspective on Beck's emotional state as well as underscoring his mounting sense of paranoia.

This is not a traditional mystery tale, given that much of the plot is revealed along the way rather than at the end. However, plenty of twists ensure unpredictability.

Harlan Coben employs a clean and simple writing style, using short chapters, a large cast, and punchy dialogue to drive the plot. The characterisations are occasionally clichéd — ambitious FBI agents that aren't too bright, the drug lord with a heart of gold — but in the end, it is the story that counts.

Jon Gill

Author Harlan Coben
Publisher Orion Trade
Contact Allen & Unwin
Phone (02) 8425 0100
Price $27.95
ISBN 0752846035
Rating ■■■■■■■■□□

The X-Economy

Issuing bold economic predictions based on the notion of business exchanges is brave, to say the least. *The X-Economy*, written by Delphi group founder Thomas Koulopoulos, avoids embarrassment by admitting that many of the companies currently involved in the exchange business will eventually be dogfood.

Some of the book's most compelling sections are those which examine the various attempts at creating online business communities, giving credit for new ideas, but also scolding for lack of vision. The central thesis of this book is that the notion of creating community via exchanges will transform business economics.

The basic argument is that the ultimate result of business exchanges will be an ever-shifting network of real-time communities designed to meet highly specific consumer and business needs. It doesn't shy away from social implications, although by leaving them for the final chapter it gives the solely business-minded the option of forgetting all about social responsibility.



Predicting the online world is a dangerous game, but Koulopoulos does it with more circumspection than many, and makes a persuasive if not utterly compelling case. *The X-Economy* is a solid overview of how the digital future might change our fundamental notions of business.

Angus Kidman

Author Thomas Koulopoulos with Nathan Palmer
Publisher Texere Publishing
Contact Allen & Unwin
Phone (02) 8425 0100
Price $57.95
ISBN 1587990741
Rating ■■■■■■■■□□

LOOK FEAR IN THE FACE

Silent Hill 2 – Not for the faint-hearted



PLUS

- WWF Smack Down hits PS2
- Wallabies' Daniel Herbert talks Rugby
- Extreme winter sports games

PlayStation.2

OFFICIAL AUSTRALIAN MAGAZINE

INCLUDING EXCLUSIVE PLAYABLE DEMOS OF EA SPORTS RUGBY, FORMULA ONE 2001 AND WACKY RACES SEPTEMBER ISSUE ON SALE NOW

On the house

Interest rates are the lowest they've been in years and the government is offering new home buyers assistance of up to $14,000, so it could be time to consider acquiring some property. We review a range of sites designed to help you locate, finance and renovate a home.



Archicentre

Managed by the home advisory division of the Royal Institute of Architects, Archicentre is an important resource for home buyers and renovators. Its site advertises Archicentre's primary services, including expert property inspections, advice on renovations and "house hunters' survival seminars". There's a regular newsletter with advice on selecting and maintaining a property, and some interesting features. For example, you can find out how the 1980 eruption of St Helens may have compromised the structural soundness of your home. There are also links to health and emergency services sites.



Online www.archicentre.com.au

Rating

Suzanne Fraser

Eco Real Estate

If you're in the market for buying, selling or building a property, why not help out the environment at the same time? Eco Real Estate is dedicated to helping people design, build, buy and sell ecologically sustainable housing. Books and videos are available, and you can tap into an online network of experts on all aspects of sustainable living.

You can also buy or sell conventional properties, and the Eco Real Estate people work with local agents to get you a good result.

A proportion of the commissions gained from sales is donated to other environmental organisations.



Online www.eco.com.au

Rating

Gail Lipscombe

First Home Owner Grant Online

This bland-looking page is a link to the equally unstylish FHOG site for each state and territory. All the sites contain basically the same information, but each has a different state revenue office logo in the corner. Dull appearance aside, they provide very comprehensive information. Any question you'd want to ask has been carefully answered and there are lots of contact details.

You can test your eligibility and download an application form. The pages also link to other relevant grants, such as the NSW First Home Plus Scheme. The links are limited to extremely useful sites.



Online www.firsthome.gov.au

Rating

Megan Smith

HomePath

Buying a property is the easiest path to a lifetime of debt. The Commonwealth Bank knows this and has set up a slick Web site with a huge listing of homes for sale across Australia. After all, the sooner you can find a property, the sooner you can start making interest repayments. HomePath offers calculators, locality information, new property alerts, buying and selling guides and a vast directory of services. However, property is not its main game, and a loan application form is never more than a click away. Little information on rival lenders is provided, so if you do plan to buy a home, this is only part of the story.



Online www.homepath.com.au

Rating

Fiona Angus

HomeSolutions

This home improvement site "provides a link between people who are needing information and those who can supply this information", and it does this very well. It has a directory of home improvement categories and subcategories, which leads to a brief description of each topic and links to suppliers that meet the site's standards for quality. Every possible subject has been covered and you can choose to receive a newsletter by email.



There is also a page on which businesses can register with the site, and a book you can purchase that is filled with hints, tips and solutions. This is a well-resourced, useful and stylish site.

Online www.homesolutions.com.au
Rating

Megan Smith

New Home Buyer

Sick of trudging through home display villages? New Home Buyer has put together an Internet catalogue of display homes, including pictures, floor plans and prices. It's a bare-bones approach, and home designs are sorted by builder and location. To find a home design you like, select a price range and choose single or double story. Most of the information is for Sydney, and includes maps for finding display villages. There isn't much else on the site, apart from advertising for *new/home/buyer* magazine. People looking for older homes or for tricks to buying a home should look elsewhere.



Online www.newhomebuyer.com.au
Rating

William Maher

Property.com.au

Looking for a new home is always nerve-racking, especially when you're buying. Purchasers need all the help they can get. Property.com.au has some useful tools such as loan calculators, a stamp duty calculator, and information about property market trends, as well as detailed information on the first home owners' grant scheme. You can browse rental or purchase properties by suburb and other criteria, and view photos to decide whether you want to inspect. You can even nominate to be alerted when housing that matches your search criteria becomes available.



Online www.property.com.au
Rating

Suzanne Fraser

Ray White Real Estate

If you've ever done the rounds in real estate, you'll have run across Ray White. For such a large concern, its online presence is not impressive. Property searches return far fewer results than expected — a search for residential properties for sale in Fairfield, NSW (where Ray White has a presence) turned up only six properties — and three of those were already sold. The virtual tours are a nice addition, but when *APC* visited the site, there were only nine available. You'll find some information on home finance, insurance and first home buyer grants, but as with most of the site content, this is Ray White-centric.



Online www.raywhite.com.au
Rating

Gail Lipscombe

Real Estate Australia

If you're new to the property game, Real Estate Australia might just be your gateway to a new address. Whether you want to rent or buy, you can search properties by location and price, and you'll find a wealth of information on real estate-related issues, such as housing finance (including a loan repayment calculator), legal issues and conveyancing. There's advice on moving house, and tips on renovations if you've just landed a 'renovator's delight'. The site's only failing is that the results of property searches often range a good deal further afield than your chosen location, which could be a reflection on the size of the listings pool.



Online realestate.com.au
Rating

Gail Lipscombe

Your Mortgage

Your Mortgage provides a wide range of information, including an explanation of the different mortgage types available and techniques for paying off your debt more quickly, as well as personal accounts from other readers. It also has daily updated rates for loans and credit cards, and an enormous array of calculators. These include general calculators for interest rates, and incredibly specific ones for materials such as tiles and paint — 25 different choices altogether. This site is an essential bookmark for anyone involved with property.



Online www.yourmortgage.com.au
Rating

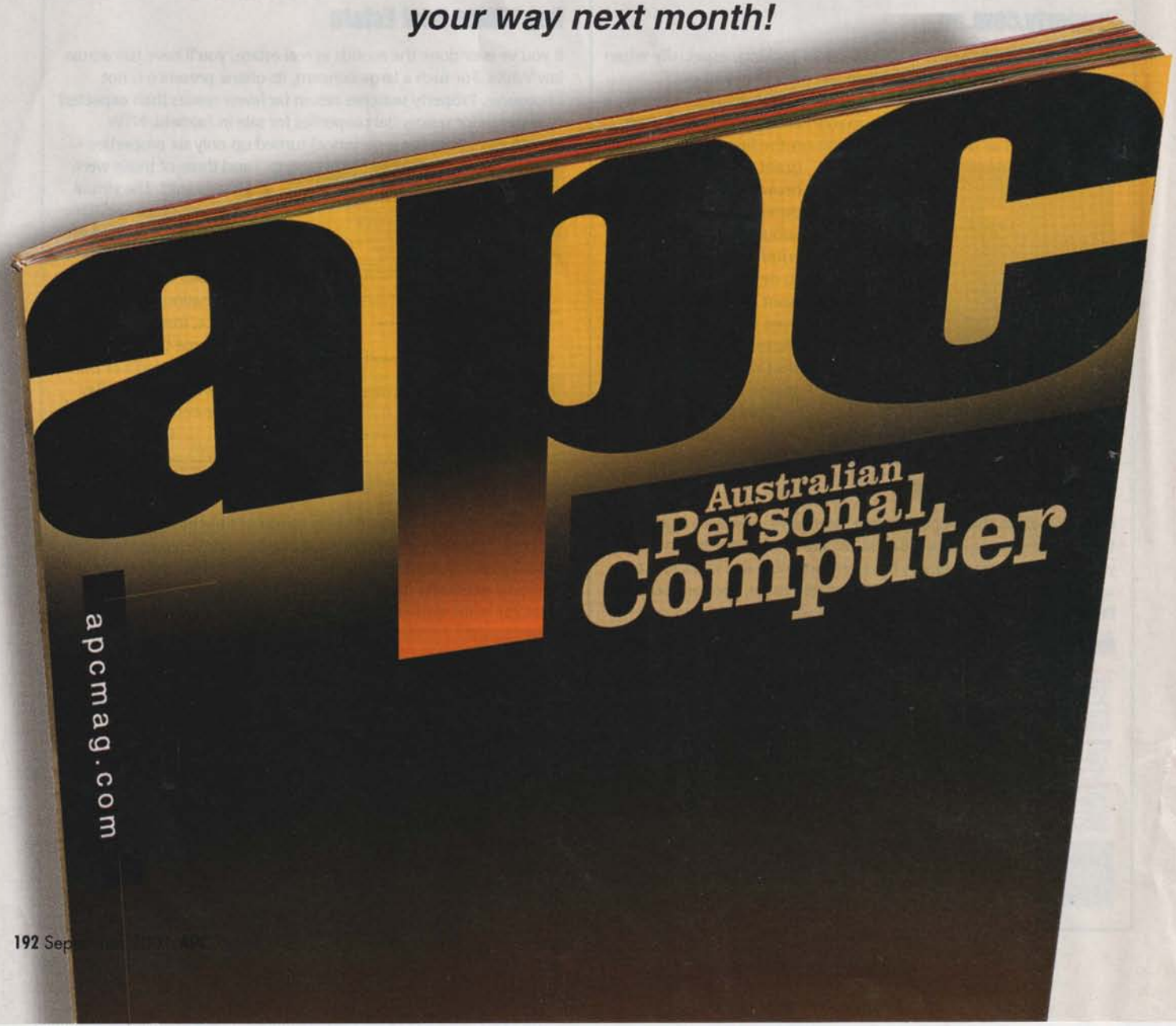
Daniel Gardiner

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